US012105933B2

(12) **United States Patent**
Leyden et al.

(10) **Patent No.: US 12,105,933 B2**
(45) **Date of Patent: Oct. 1, 2024**

(54) **GRAPHICAL USER INTERFACE TO TRACK DYNAMIC DATA**

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(73) Assignee: **IHS MARKIT**, New York, NY (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **18/102,653**

(22) Filed: **Jan. 27, 2023**

(65) **Prior Publication Data**

US 2023/0176713 A1 Jun. 8, 2023

Related U.S. Application Data

(63) Continuation of application No. 17/319,715, filed on May 13, 2021, now Pat. No. 11,625,149, which is a (Continued)

(51) **Int. Cl.**
G06T 11/20 (2006.01)
G06F 3/0482 (2013.01)
(Continued)

(52) **U.S. Cl.**
CPC ***G06F 3/0482*** (2013.01); ***G06F 3/0483*** (2013.01); ***G06Q 40/04*** (2013.01); ***G06T 11/206*** (2013.01)

(58) **Field of Classification Search**
CPC G06F 3/0482; G06F 3/0483; G06Q 40/04; G06T 11/206
See application file for complete search history.

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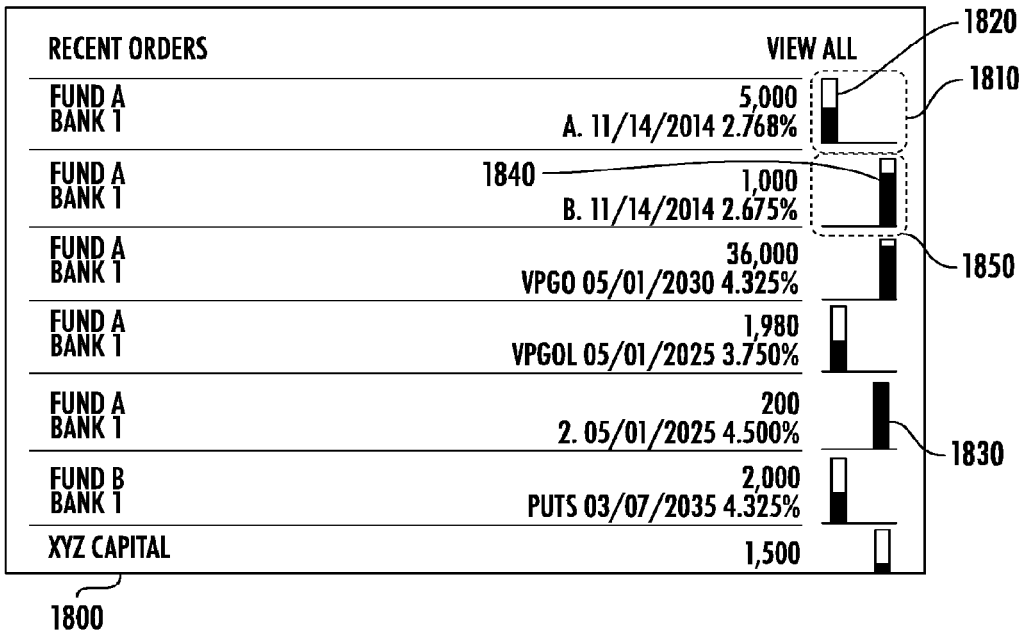
(Continued)

Primary Examiner — Hien L Duong
(74) *Attorney, Agent, or Firm* — FOLEY & LARDNER LLP

(57) **ABSTRACT**

Disclosed are methods and systems of displaying graphical user interfaces (GUIs) that illustrate various offering analytics and insights. The GUI display selectable graphical components representing attributes of maturity bonds, wherein when a user interacts with a first graphical component corresponding to a first maturity bond, the server dynamically updates a second section of the GUI. The second section of the GUI displays time periods corresponding to a maturity date for the first maturity bond, wherein the server displays a vertical bar for each time period, a height of the vertical bar indicating a value of the maturity bond, wherein each vertical bar is divided into two areas a first area corresponding to a competitive sale of the first maturity bond, and a second area corresponding to a negotiated sale of the first maturity bond.

20 Claims, 23 Drawing Sheets



Related U.S. Application Data

continuation of application No. 16/783,014, filed on Feb. 5, 2020, now Pat. No. 11,048,386, which is a continuation-in-part of application No. 16/407,069, filed on May 8, 2019, now Pat. No. 11,042,263, which is a continuation of application No. 15/815,329, filed on Nov. 16, 2017, now Pat. No. 10,331,302.

(60) Provisional application No. 62/424,239, filed on Nov. 18, 2016.

(51) **Int. Cl.**
G06F 3/0483 (2013.01)
G06Q 40/04 (2012.01)

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2011/0246391	A1	10/2011	Henderson	
2011/0246873	A1	10/2011	Tolle et al.	
2012/0218254	A1 *	8/2012	Abeln	G06T 19/00 345/419
2012/0313957	A1	12/2012	Fisher et al.	
2013/0055146	A1	2/2013	Armitage	
2013/0073479	A1	3/2013	Koblas et al.	
2013/0204768	A1 *	8/2013	Avery	G06Q 30/08 705/37
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2014/0279686	A1 *	9/2014	Avery	G06Q 40/06 705/36 R
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2017/0098318	A1	4/2017	Iannaccone et al.	
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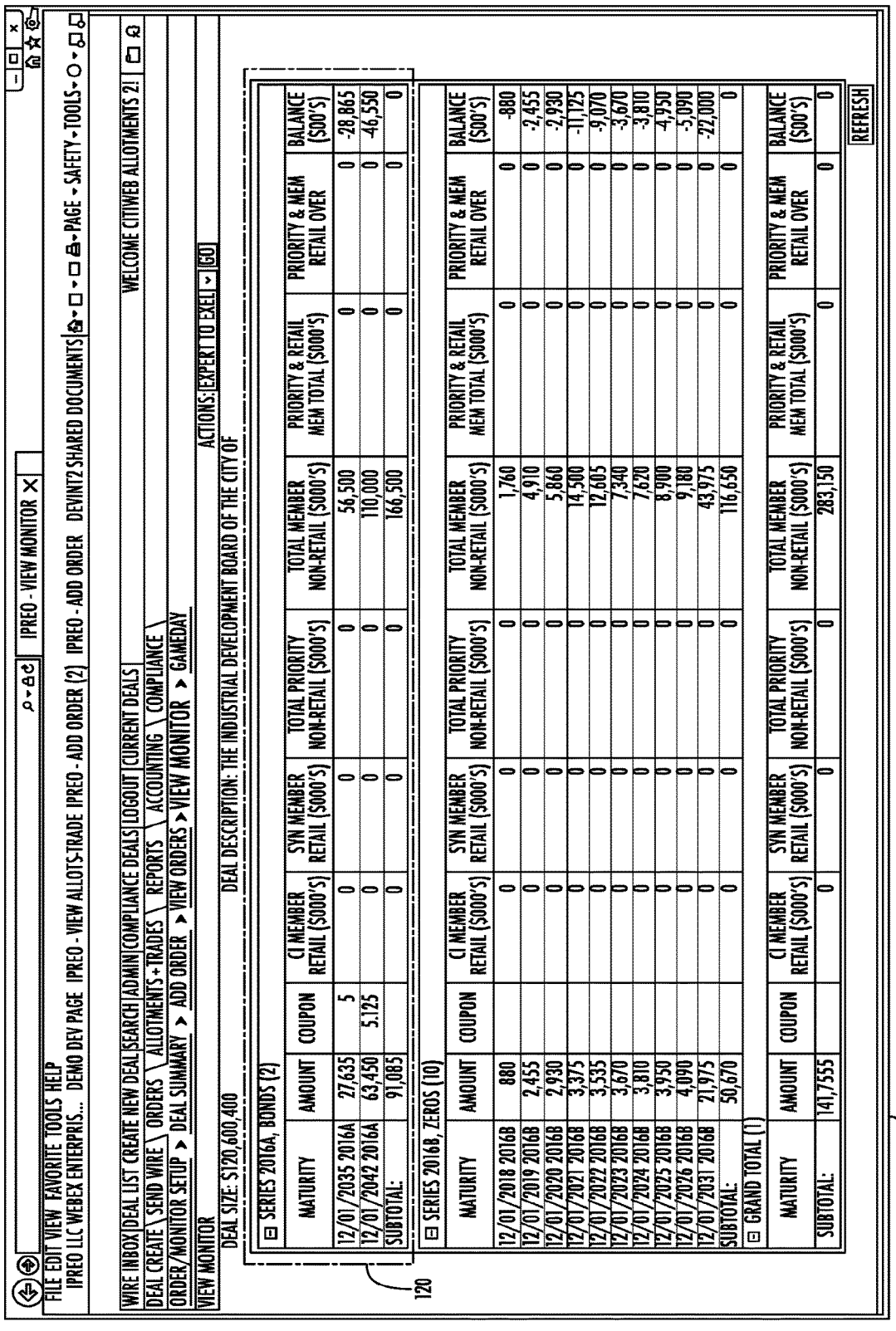


SERIES 2016A, BONDS (2)

MATURITY	AMOUNT	COUPON	CI MEMBER RETAIL ($000'S)	SYN MEMBER RETAIL ($000'S)	TOTAL PRIORITY NON-RETAIL ($000'S)	TOTAL MEMBER NON-RETAIL ($000'S)	PRIORITY & RETAIL MEM TOTAL ($000'S)	PRIORITY & MEM RETAIL OVER	BALANCE ($00'S)
12/01/2035 2016A	27,635	5	0	0	0	56,500	0	0	-28,865
12/01/2042 2016A	63,450	5.125	0	0	0	110,000	0	0	-46,550
SUBTOTAL:	91,085		0	0	0	166,500	0	0	0

SERIES 2016B, ZEROS (10)

MATURITY	AMOUNT	COUPON	CI MEMBER RETAIL ($000'S)	SYN MEMBER RETAIL ($000'S)	TOTAL PRIORITY NON-RETAIL ($000'S)	TOTAL MEMBER NON-RETAIL ($000'S)	PRIORITY & RETAIL MEM TOTAL ($000'S)	PRIORITY & MEM RETAIL OVER	BALANCE ($00'S)
12/01/2018 2016B	880		0	0	0	1,760	0	0	-880
12/01/2019 2016B	2,455		0	0	0	4,910	0	0	-2,455
12/01/2020 2016B	2,930		0	0	0	5,860	0	0	-2,930
12/01/2021 2016B	3,375		0	0	0	14,500	0	0	-11,125
12/01/2022 2016B	3,535		0	0	0	12,605	0	0	-9,070
12/01/2023 2016B	3,670		0	0	0	7,340	0	0	-3,670
12/01/2024 2016B	3,810		0	0	0	7,620	0	0	-3,810
12/01/2025 2016B	3,950		0	0	0	8,900	0	0	-4,950
12/01/2026 2016B	4,090		0	0	0	9,180	0	0	-5,090
12/01/2031 2016B	21,975		0	0	0	43,975	0	0	-22,000
SUBTOTAL:	50,670		0	0	0	116,650	0	0	0

GRAND TOTAL (1)

MATURITY	AMOUNT	COUPON	CI MEMBER RETAIL ($000'S)	SYN MEMBER RETAIL ($000'S)	TOTAL PRIORITY NON-RETAIL ($000'S)	TOTAL MEMBER NON-RETAIL ($000'S)	PRIORITY & RETAIL MEM TOTAL ($000'S)	PRIORITY & MEM RETAIL OVER	BALANCE ($00'S)
SUBTOTAL:	141,7555		0	0	0	283,150	0	0	0

REFRESH

FIG. 1
PRIOR ART

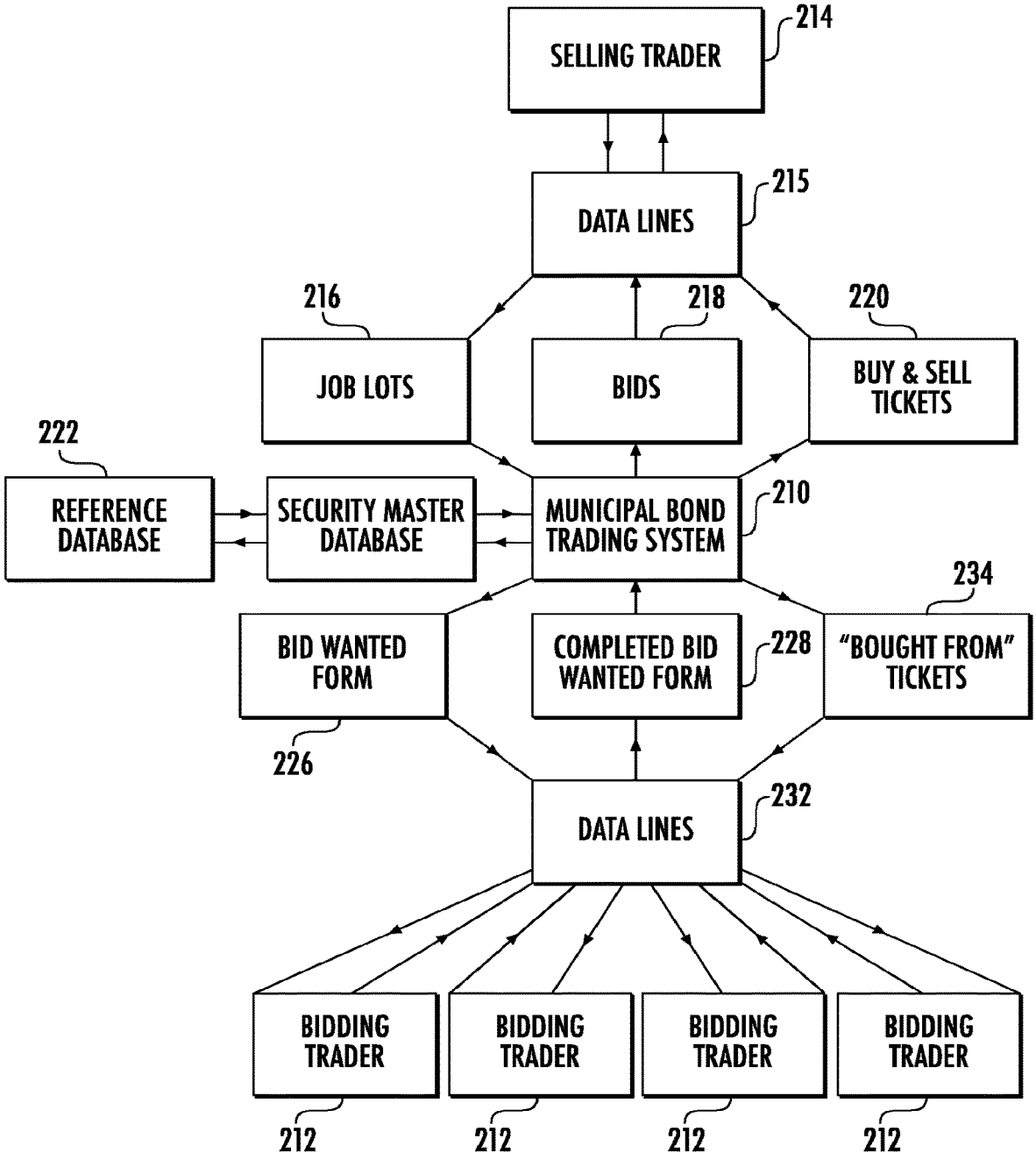

SELLING TRADER
214
DATA LINES
215
216
218
220
JOB LOTS
BIDS
BUY & SELL TICKETS
222
REFERENCE DATABASE
SECURITY MASTER DATABASE
MUNICIPAL BOND TRADING SYSTEM
210
234
BID WANTED FORM
COMPLETED BID WANTED FORM
228
"BOUGHT FROM" TICKETS
226
DATA LINES
232
BIDDING TRADER
BIDDING TRADER
BIDDING TRADER
BIDDING TRADER
212
212
212
212

FIG. 2

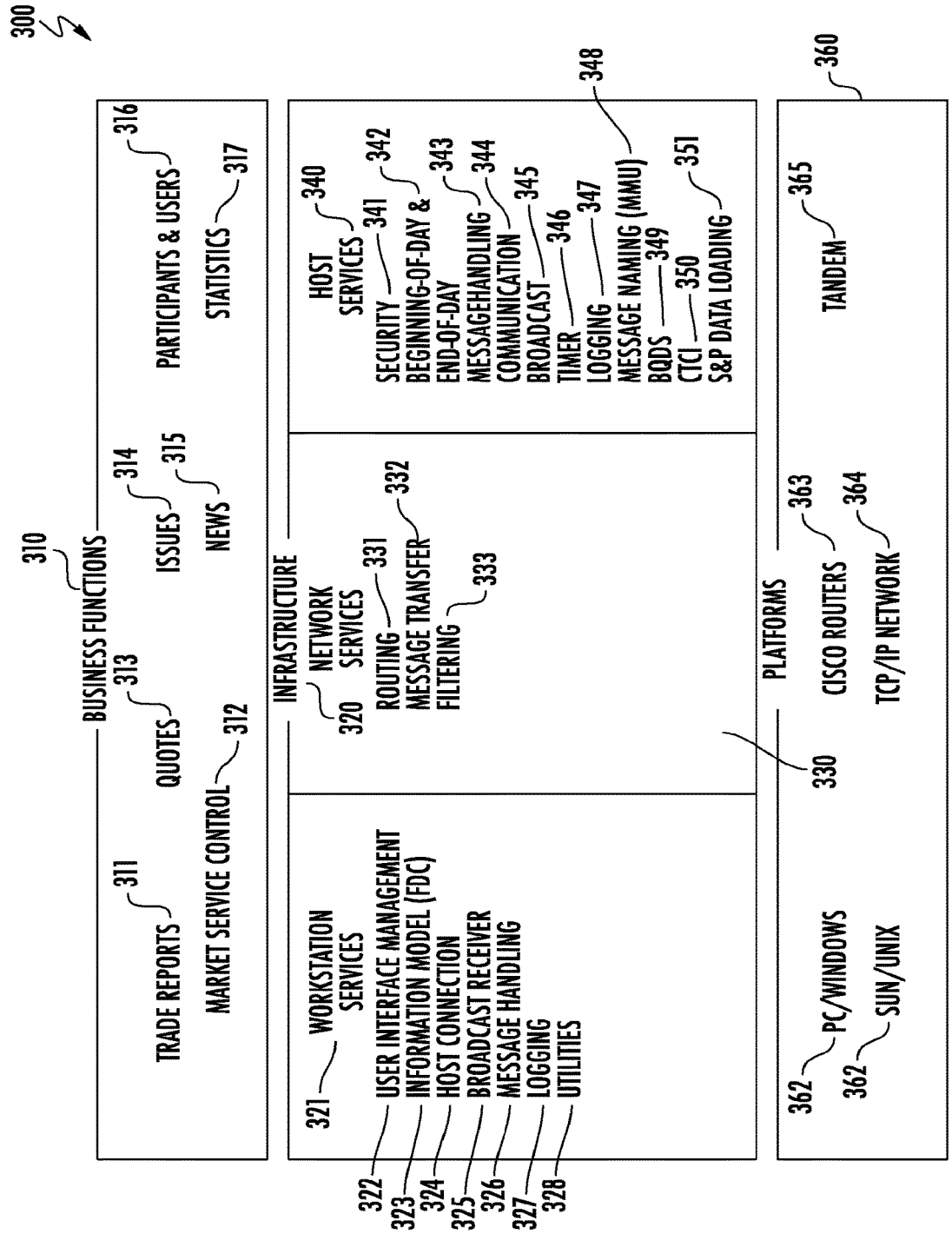

300
310
BUSINESS FUNCTIONS
311
TRADE REPORTS
313
QUOTES
312
MARKET SERVICE CONTROL
314
ISSUES
315
NEWS
316
PARTICIPANTS & USERS
317
STATISTICS
INFRASTRUCTURE
320
NETWORK SERVICES
ROUTING 331
MESSAGE TRANSFER 332
FILTERING 333
HOST SERVICES 340
SECURITY 341
BEGINNING-OF-DAY & END-OF-DAY 342
MESSAGEHANDLING 343
COMMUNICATION 344
BROADCAST 345
TIMER 346
LOGGING 347
MESSAGE NAMING (MMU) 348
BQDS 349
CTCI 350
S&P DATA LOADING 351
321
WORKSTATION SERVICES
322 USER INTERFACE MANAGEMENT
323 INFORMATION MODEL (FDC)
324 HOST CONNECTION
325 BROADCAST RECEIVER
326 MESSAGE HANDLING
327 LOGGING
328 UTILITIES
330
PLATFORMS
363
CISCO ROUTERS
364
TCP/IP NETWORK
360
TANDEM
365
362 PC/WINDOWS
362 SUN/UNIX

FIG. 3

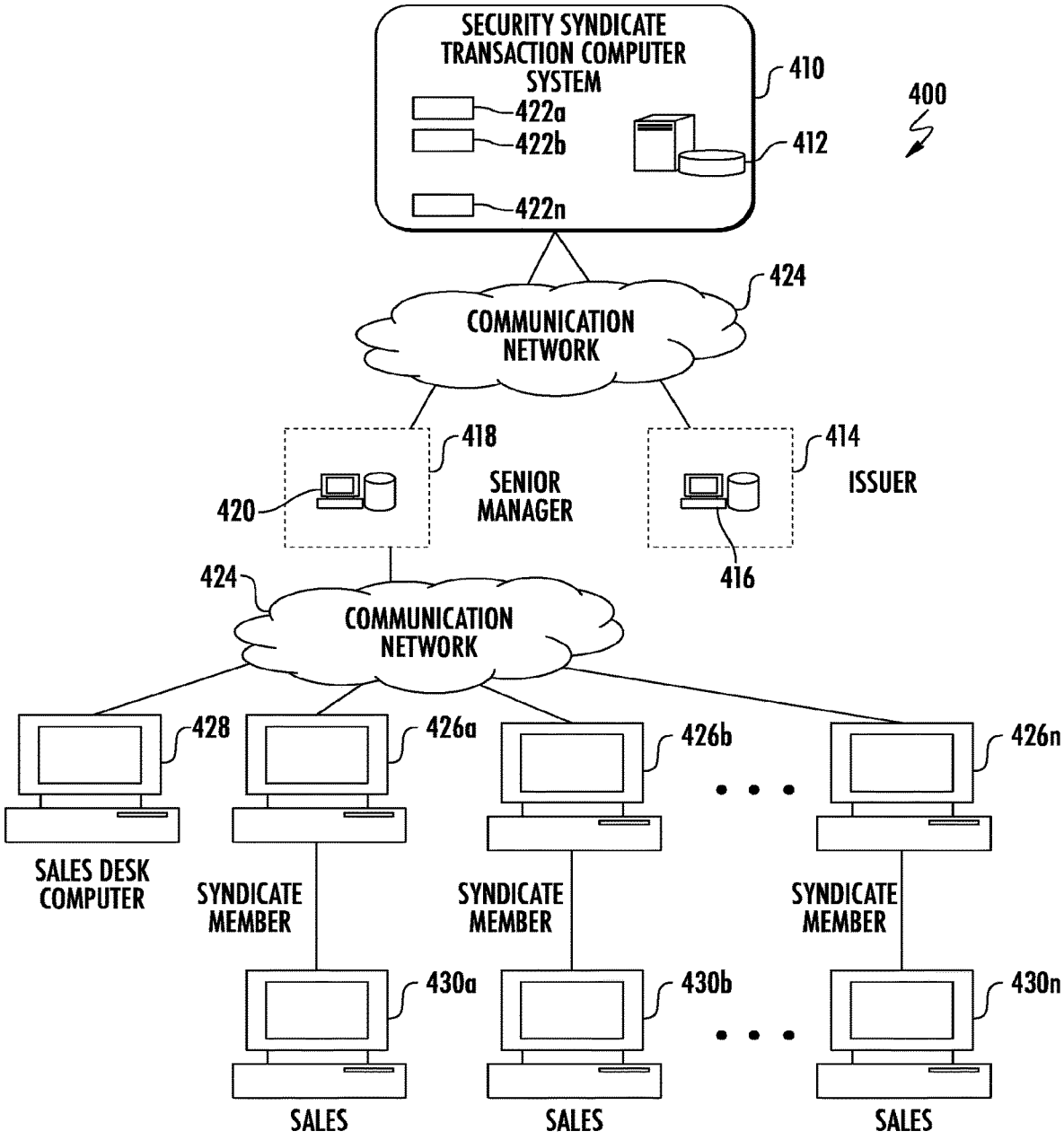

SECURITY SYNDICATE TRANSACTION COMPUTER SYSTEM
410
400
422a
422b
412
422n
424
COMMUNICATION NETWORK
418
414
420
SENIOR MANAGER
ISSUER
416
424
COMMUNICATION NETWORK
428
426a
426b
426n
SALES DESK COMPUTER
SYNDICATE MEMBER
SYNDICATE MEMBER
SYNDICATE MEMBER
430a
430b
430n
SALES
SALES
SALES

FIG. 4A

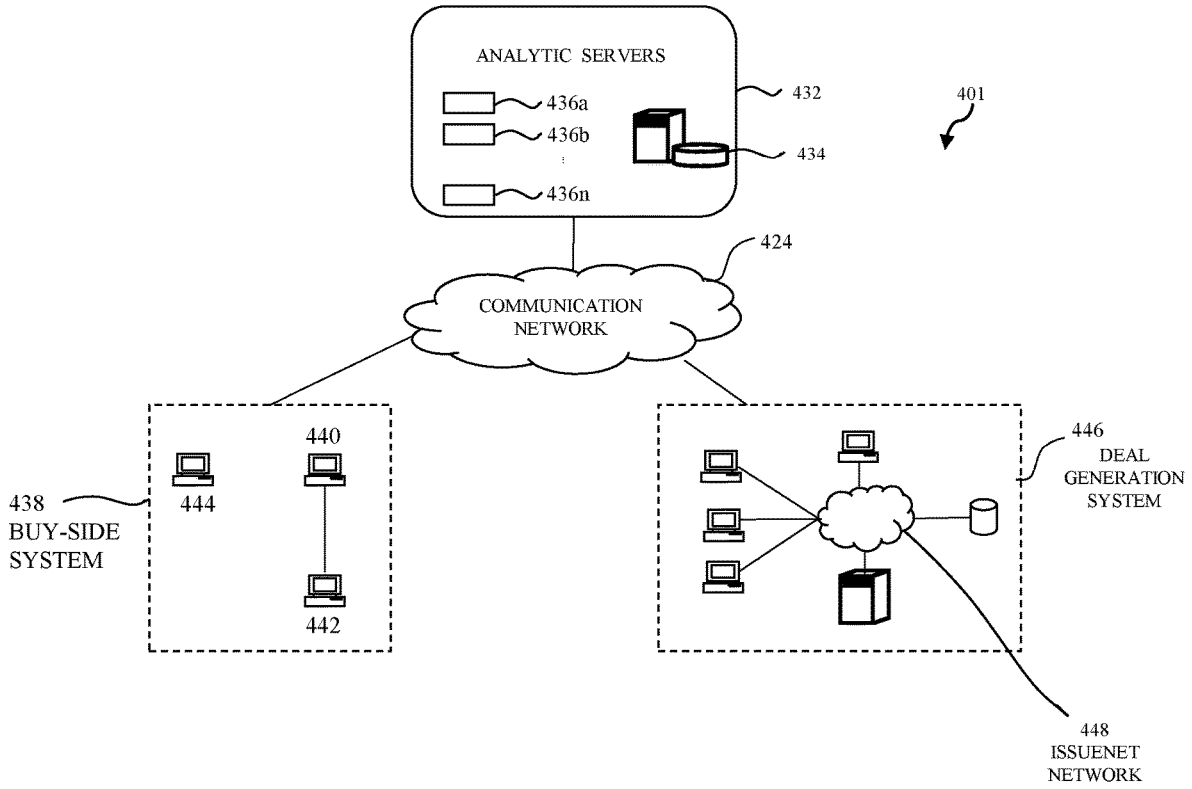

ANALYTIC SERVERS
436a
436b
436n
432
434
401
424
COMMUNICATION NETWORK
438
BUY-SIDE SYSTEM
444
440
442
446
DEAL GENERATION SYSTEM
448
ISSUENET NETWORK

FIG. 4B

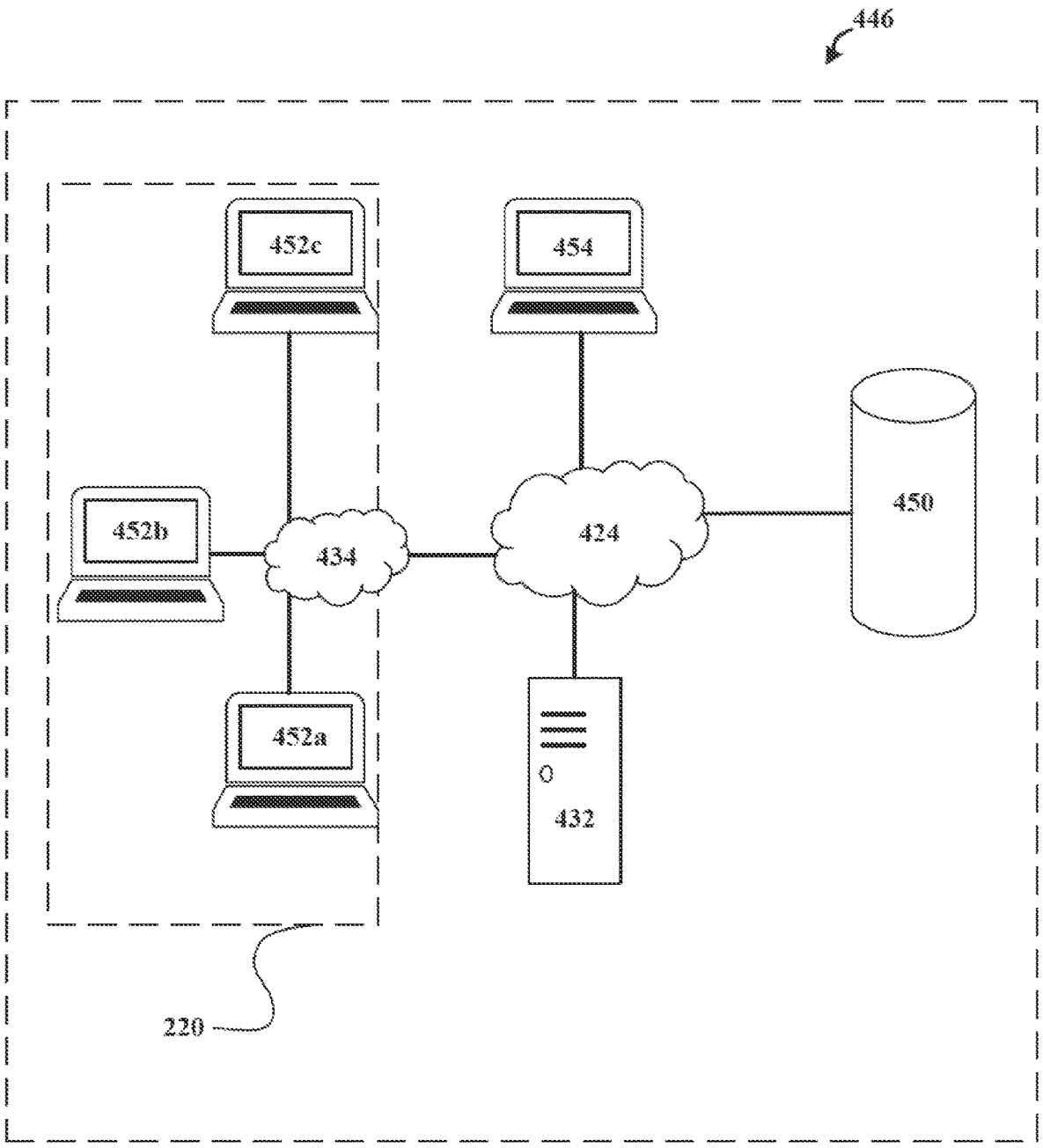


FIG. 4C

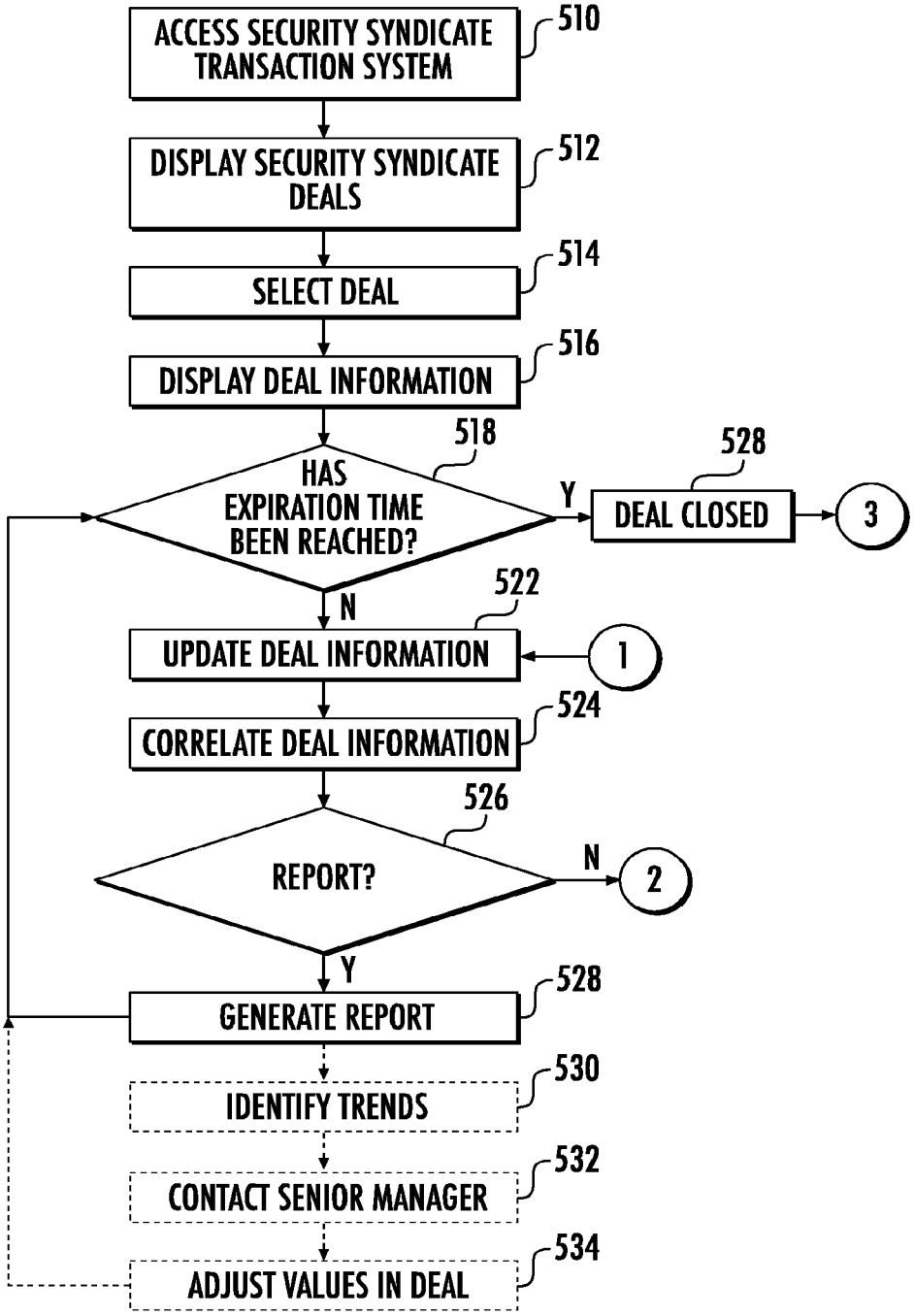

ACCESS SECURITY SYNDICATE TRANSACTION SYSTEM
510
DISPLAY SECURITY SYNDICATE DEALS
512
SELECT DEAL
514
DISPLAY DEAL INFORMATION
516
HAS EXPIRATION TIME BEEN REACHED?
518
Y
528
DEAL CLOSED
3
N
522
UPDATE DEAL INFORMATION
1
CORRELATE DEAL INFORMATION
524
REPORT?
526
N
2
Y
GENERATE REPORT
528
IDENTIFY TRENDS
530
CONTACT SENIOR MANAGER
532
ADJUST VALUES IN DEAL
534

FIG. 5

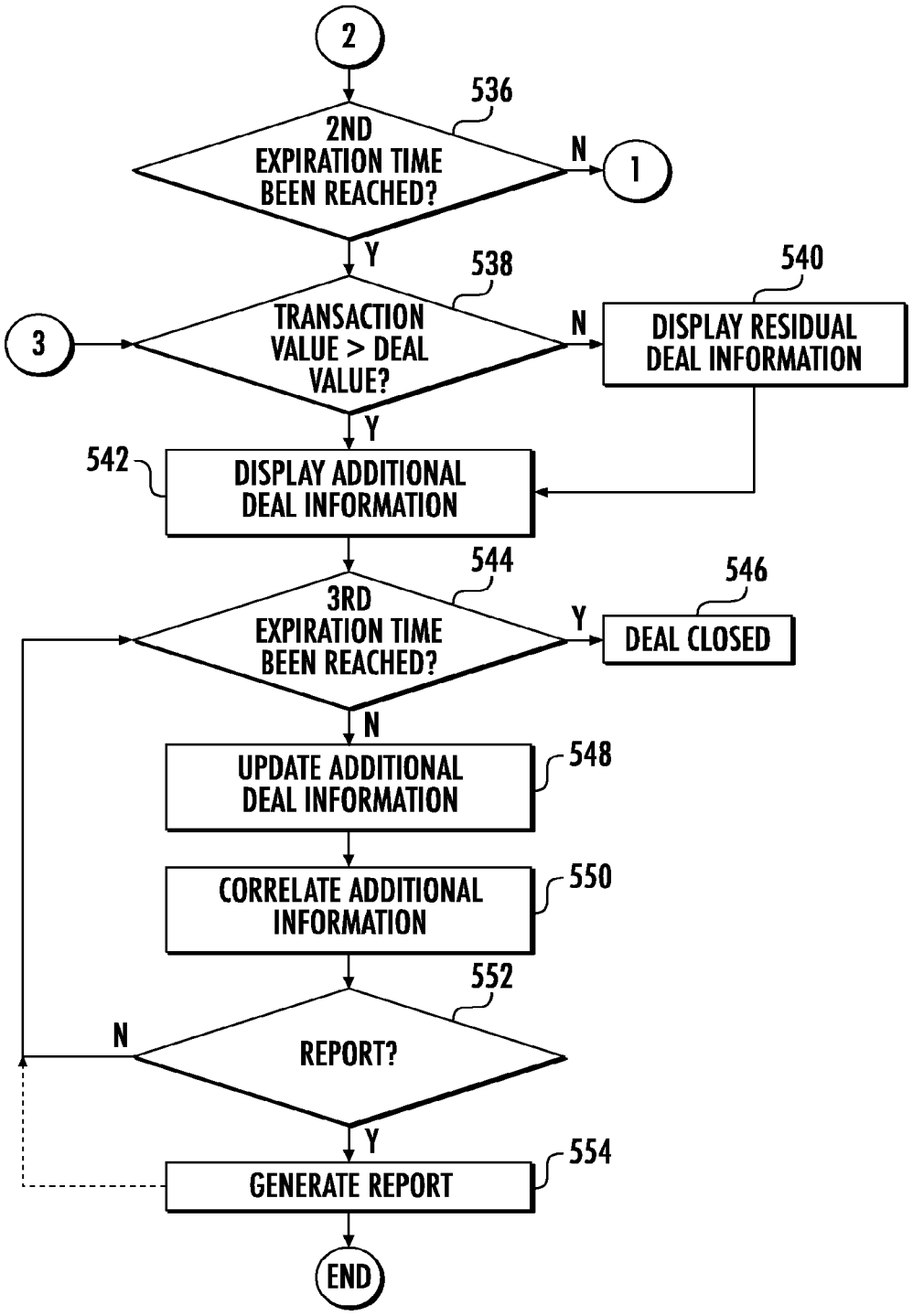

2
536
2ND EXPIRATION TIME BEEN REACHED?
N
1
Y
538
TRANSACTION VALUE > DEAL VALUE?
3
N
540
DISPLAY RESIDUAL DEAL INFORMATION
Y
542
DISPLAY ADDITIONAL DEAL INFORMATION
544
3RD EXPIRATION TIME BEEN REACHED?
Y
546
DEAL CLOSED
N
548
UPDATE ADDITIONAL DEAL INFORMATION
550
CORRELATE ADDITIONAL INFORMATION
552
N
REPORT?
Y
554
GENERATE REPORT
END

FIG. 6

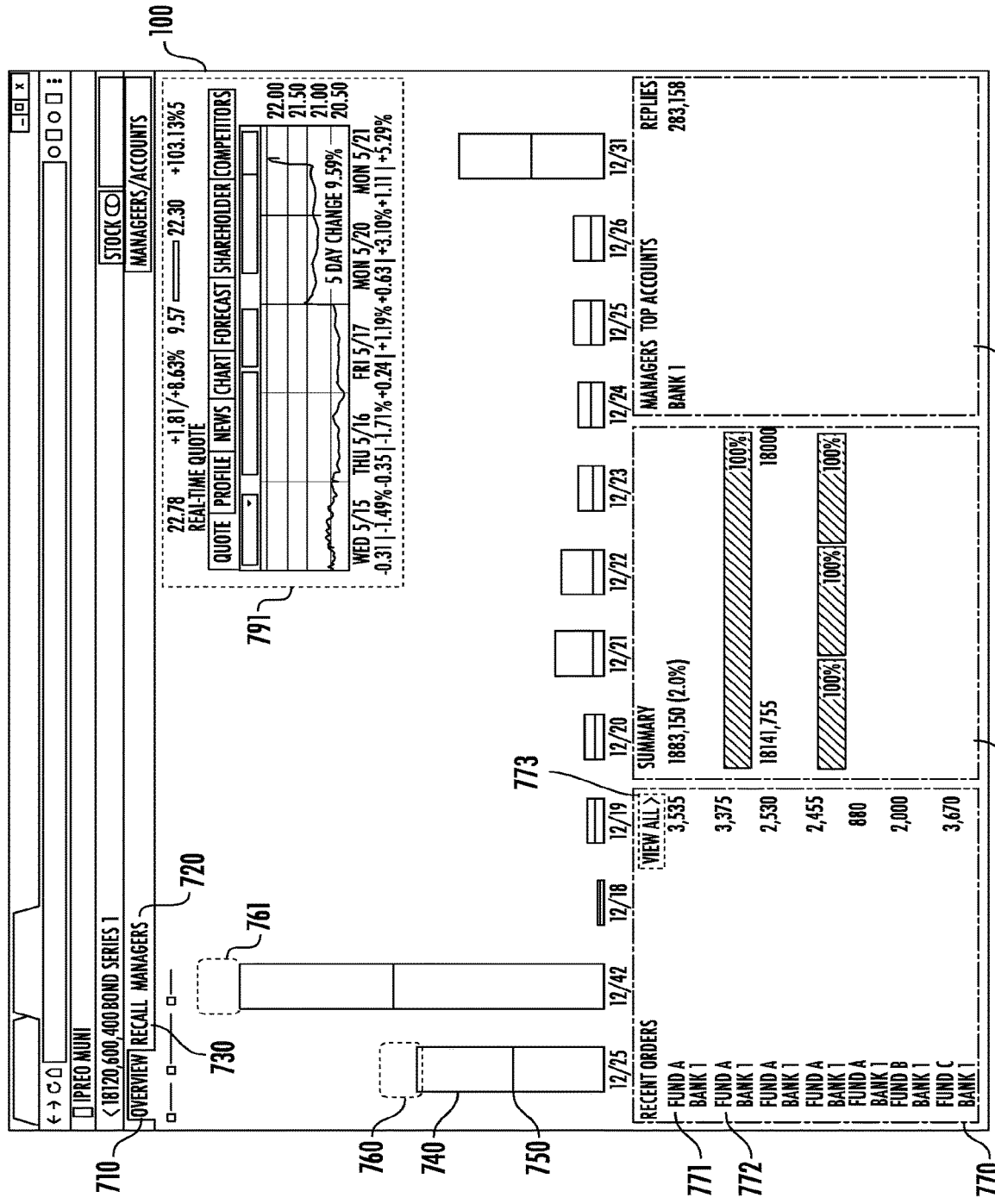

100
IPREO MUNI
<18120,600,400 BOND SERIES 1
OVERVIEW
RECALL MANAGERS
STOCK
MANAGEERS/ACCOUNTS
22.78 +1.81/+8.63% 9.57 22.30 +103.13%5
REAL-TIME QUOTE
QUOTE PROFILE NEWS CHART FORECAST SHAREHOLDER COMPETITORS
WED 5/15 THU 5/16 FRI 5/17 MON 5/20 MON 5/21
-0.31 | -1.49% -0.35 | -1.71% +0.24 | +1.19% +0.63 | +3.10% +1.11 | +5.29%
5 DAY CHANGE 9.59%
22.00
21.50
21.00
20.50
12/25 12/42 12/18 12/19 12/20 12/21 12/22 12/23 12/24 12/25 12/26 12/31
RECENT ORDERS
FUND A BANK 1 3,535
FUND A BANK 1 3,375
FUND A BANK 1 2,530
FUND A BANK 1 2,455
FUND A BANK 1 880
FUND A BANK 1 2,000
FUND B BANK 1 3,670
FUND C BANK 1
VIEW ALL >
SUMMARY
1883,150 (2.0%)
18141,755
18000
100%
MANAGERS TOP ACCOUNTS
BANK 1
REPLIES
283,158
710
720
730
740
750
760
761
770
771
772
773
780
790
791

FIG. 7

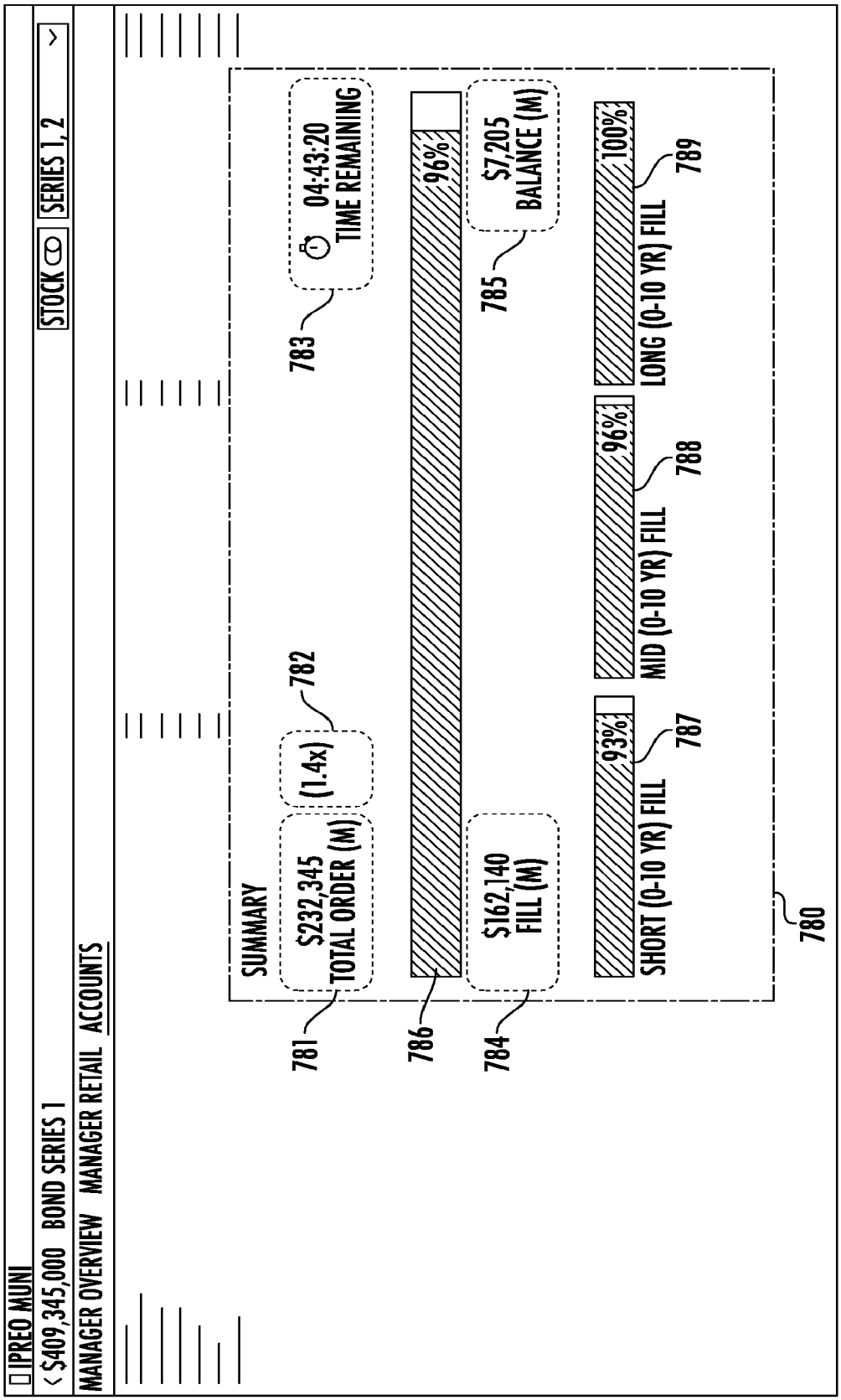

IPREO MUNI
< $409,345,000 BOND SERIES 1
STOCK
SERIES 1, 2
MANAGER OVERVIEW MANAGER RETAIL ACCOUNTS
SUMMARY
$232,345
TOTAL ORDER (M)
781
(1.4x)
782
04:43:20
TIME REMAINING
783
$162,140
FILL (M)
784
96%
786
$7,205
BALANCE (M)
785
93%
SHORT (0-10 YR) FILL
787
96%
MID (0-10 YR) FILL
788
100%
LONG (0-10 YR) FILL
789
780

FIG. 8

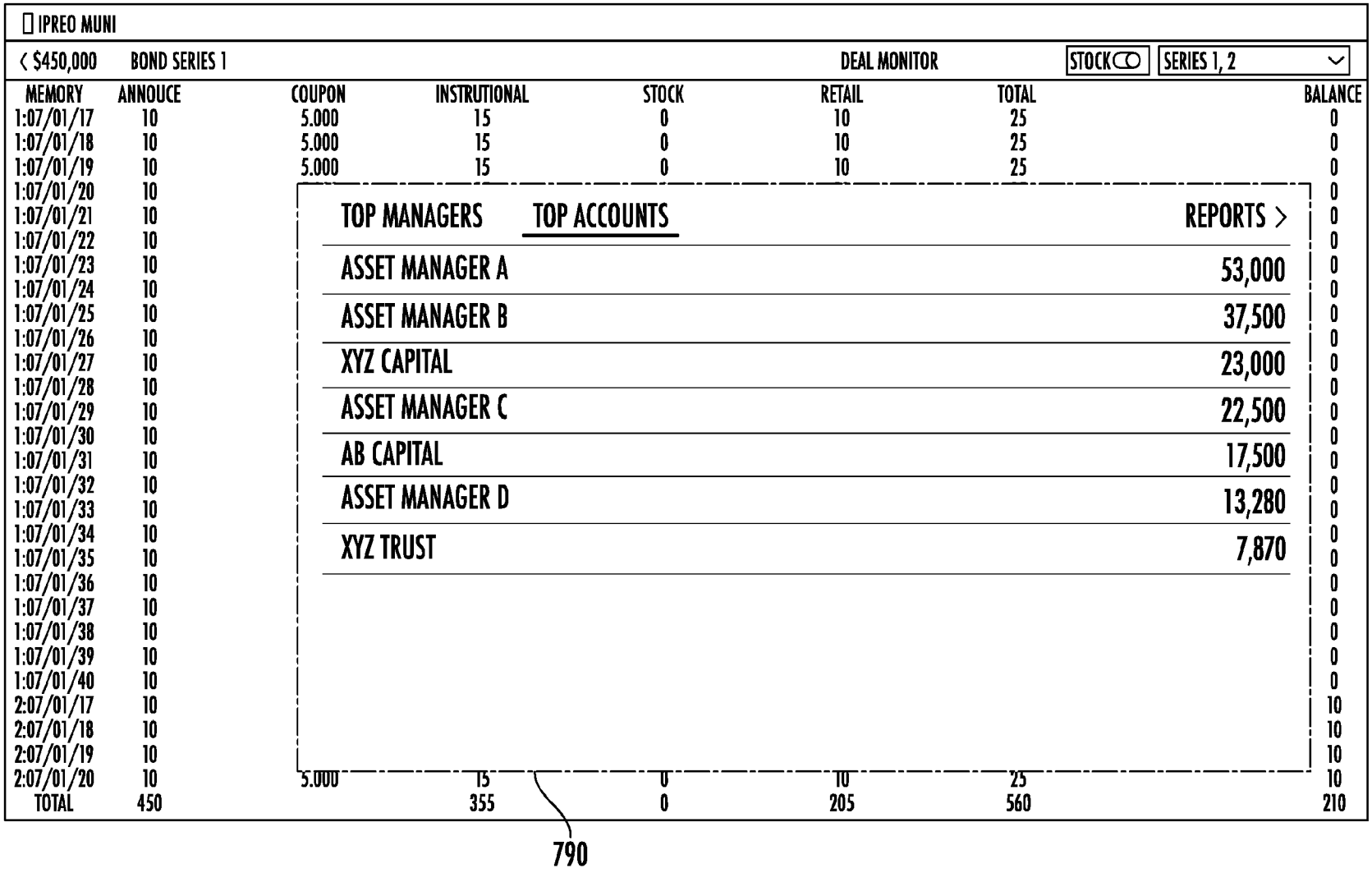

IPREO MUNI
< $450,000
BOND SERIES 1
DEAL MONITOR
STOCK
SERIES 1, 2
MEMORY ANNOUCE COUPON INSTRUTIONAL STOCK RETAIL TOTAL BALANCE
1:07/01/17 10 5.000 15 0 10 25 0
1:07/01/18 10 5.000 15 0 10 25 0
1:07/01/19 10 5.000 15 0 10 25 0
1:07/01/20 10
1:07/01/21 10
1:07/01/22 10
1:07/01/23 10
1:07/01/24 10
1:07/01/25 10
1:07/01/26 10
1:07/01/27 10
1:07/01/28 10
1:07/01/29 10
1:07/01/30 10
1:07/01/31 10
1:07/01/32 10
1:07/01/33 10
1:07/01/34 10
1:07/01/35 10
1:07/01/36 10
1:07/01/37 10
1:07/01/38 10
1:07/01/39 10
1:07/01/40 10
2:07/01/17 10
2:07/01/18 10
2:07/01/19 10
2:07/01/20 10 5.000 15 0 10 25 10
TOTAL 450 355 0 205 560 210
TOP MANAGERS
TOP ACCOUNTS
REPORTS >
ASSET MANAGER A 53,000
ASSET MANAGER B 37,500
XYZ CAPITAL 23,000
ASSET MANAGER C 22,500
AB CAPITAL 17,500
ASSET MANAGER D 13,280
XYZ TRUST 7,870
790

FIG. 9

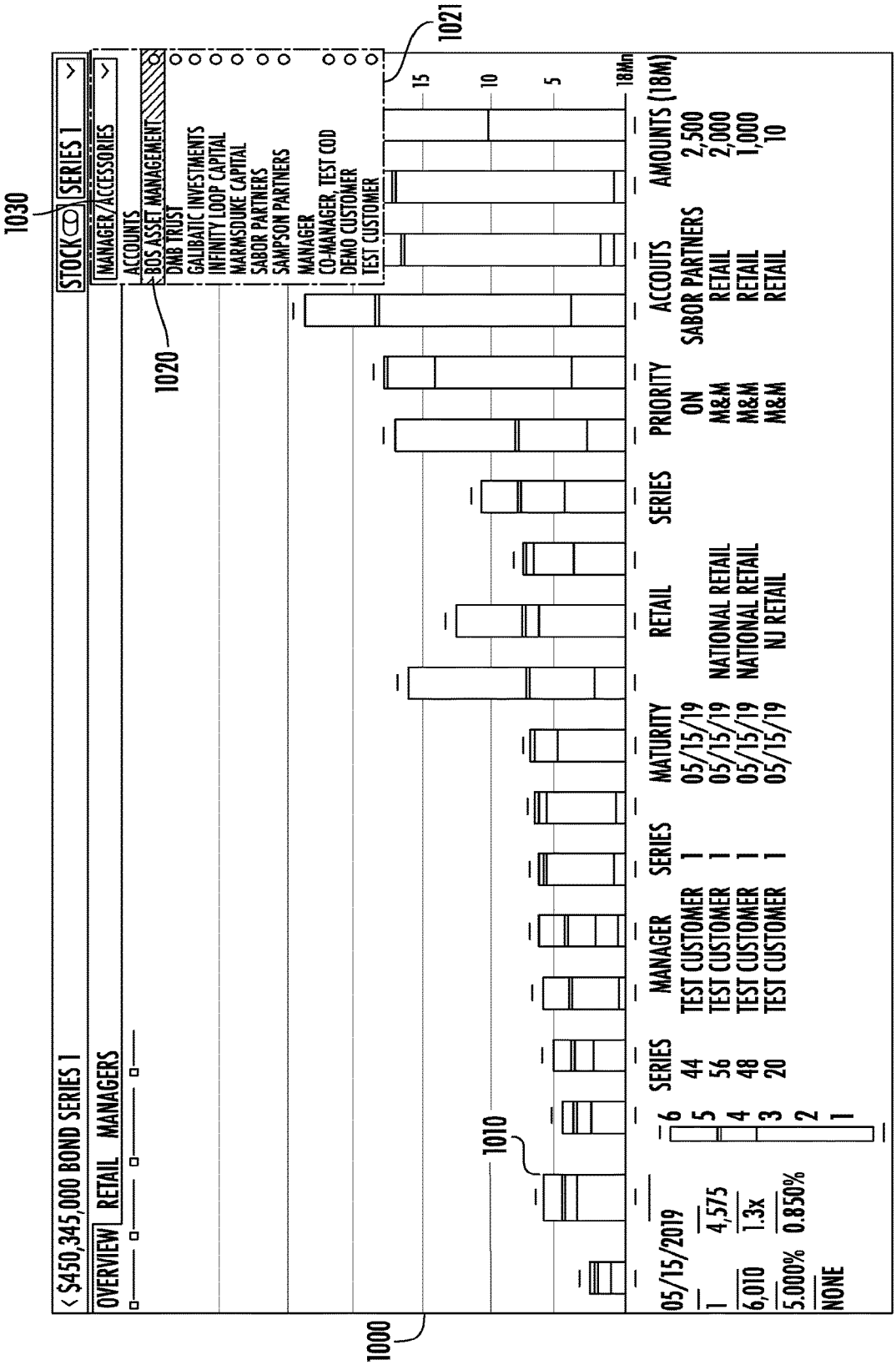

1000
1010
1020
1021
1030
< $450,345,000 BOND SERIES 1
OVERVIEW
RETAIL
MANAGERS
STOCK
SERIES 1
MANAGER/ACCESSORIES
ACCOUNTS
BOS ASSET MANAGEMENT
DMB TRUST
GALIBATIC INVESTMENTS
INFINITY LOOP CAPITAL
MARMSDUKE CAPITAL
SABOR PARTNERS
SAMPSON PARTNERS
MANAGER
CO-MANAGER, TEST COD
DEMO CUSTOMER
TEST CUSTOMER
15
10
5
18Mn
05/15/2019
1
4,575
6,010
1.3x
5.000%
0.850%
NONE
SERIES
MANAGER
SERIES
MATURITY
RETAIL
SERIES
PRIORITY
ACCOUTS
AMOUNTS (18M)
44
TEST CUSTOMER
1
05/15/19
ON
SABOR PARTNERS
2,500
56
TEST CUSTOMER
1
05/15/19
NATIONAL RETAIL
M&M
RETAIL
2,000
48
TEST CUSTOMER
1
05/15/19
NATIONAL RETAIL
M&M
RETAIL
1,000
20
TEST CUSTOMER
1
05/15/19
NJ RETAIL
M&M
RETAIL
10

FIG. 10

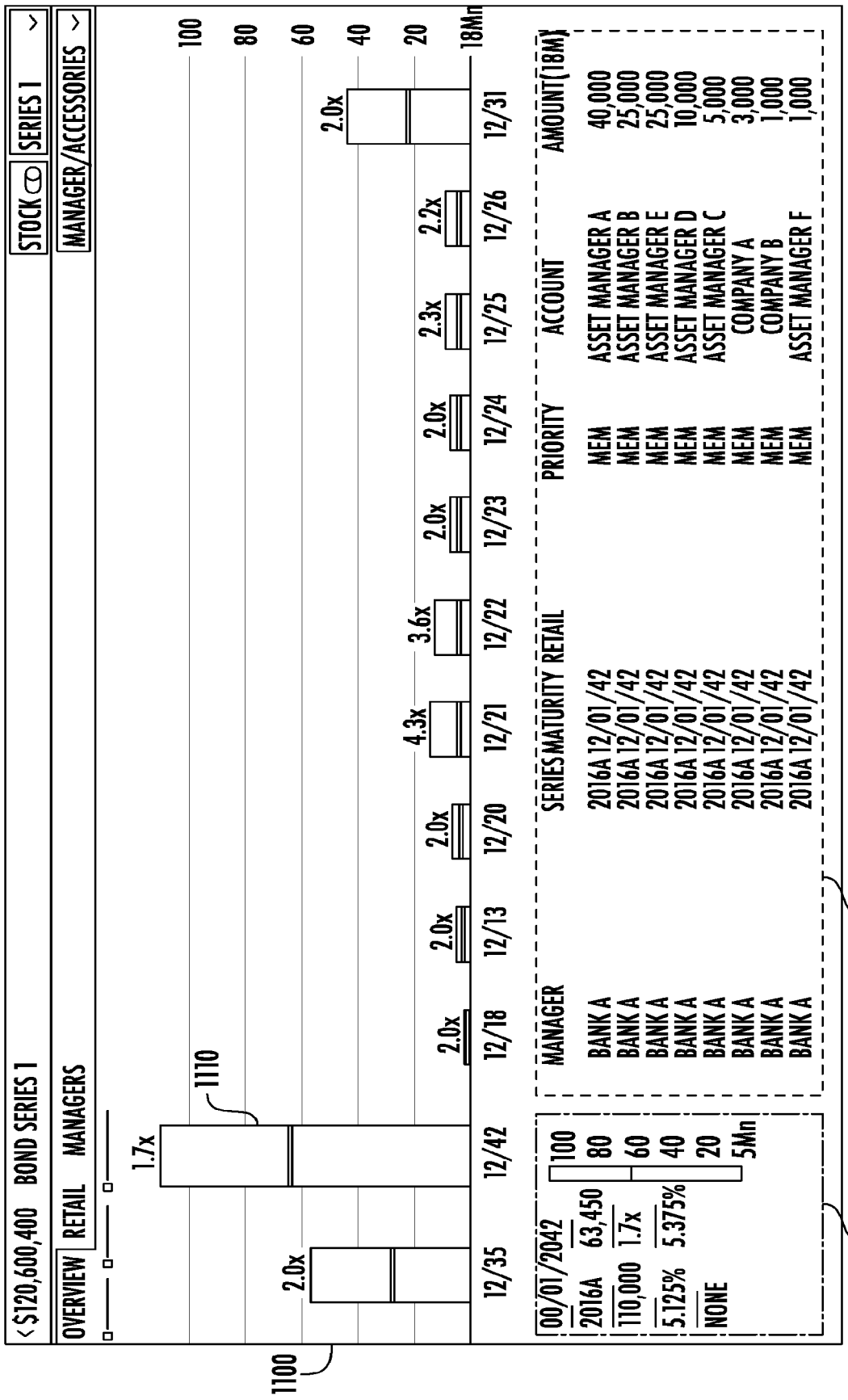

< $120,600,400 BOND SERIES 1
STOCK SERIES 1
OVERVIEW RETAIL MANAGERS
MANAGER/ACCESSORIES
100
80
60
40
20
18Mn
1.7x
2.0x
2.0x
2.0x
2.0x
4.3x
3.6x
2.0x
2.0x
2.3x
2.2x
2.0x
12/35
12/42
12/18
12/13
12/20
12/21
12/22
12/23
12/24
12/25
12/26
12/31
1110
1100
00/01/2042
2016A
110,000
5.125%
NONE
63,450
1.7x
5.375%
100
80
60
40
20
5Mn
1120
MANAGER
BANK A
SERIES MATURITY RETAIL
2016A 12/01/42
PRIORITY
MEM
ACCOUNT
ASSET MANAGER A
COMPANY A
COMPANY B
ASSET MANAGER B
ASSET MANAGER C
ASSET MANAGER D
ASSET MANAGER E
ASSET MANAGER F
AMOUNT(18M)
40,000
25,000
25,000
10,000
5,000
3,000
1,000
1,000
1130

FIG. 11

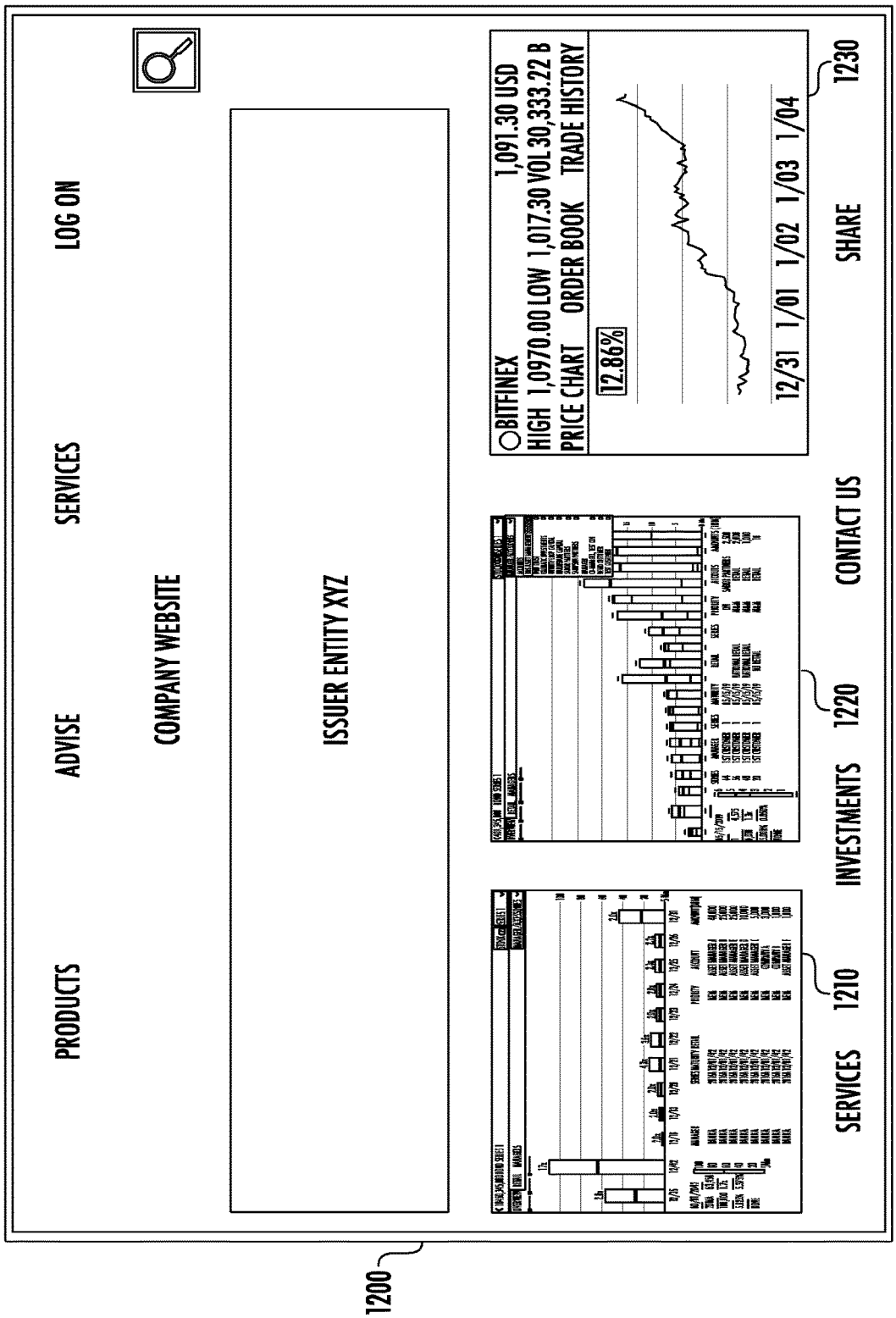

PRODUCTS
ADVISE
COMPANY WEBSITE
SERVICES
LOG ON
ISSUER ENTITY XYZ
BITFINEX 1,091.30 USD
HIGH 1,0970.00 LOW 1,017.30 VOL 30,333.22 B
PRICE CHART ORDER BOOK TRADE HISTORY
12.86%
12/31 1/01 1/02 1/03 1/04
SHARE
1230
CONTACT US
INVESTMENTS
1220
SERVICES
1210
1200

FIG. 12

OVERVIEW RETALL PRIORITY											
MATURITY	SERIES	COUPON	AMOUNT	NJ RETAIL	NA RETAIL	TOTAL RETAIL	INSTITUTIONAL	STOCK	TOTAL	BALANCE	SUBSCRIPTION
TOTAL: (AMOUNT IN 18M)			219,345	44,590	14,655	59,245	224,050	26,000	300,295	34,805	1.4x
05/15/2017	1	5.000%	5,000	0	0	0	0	0	0	5,000	0%
07/01/2017	2	5.000%	10,000	0	0	0	2,900	0	2,900	7,100	29%
05/15/2018	1	5.000%	2,260	50	1,100	1,150	2,000	0	3,150	-890	1.4x
07/01/2018	2	5.000%	10,000	0	0	0	3,000	0	3,000	7,000	30%
05/15/2019	1	5.000%	4,575	60	3,500	3,560	2,500	4,000	10,060	-5,485	2.2x
05/15/2020	1	5.000%	3,740	0	2,650	2,650	2,000	0	4,650	-910	1.2x
05/15/2021	1	5.000%	3,920	2,300	3,000	5,300	0	0	5,300	-1,380	1.4x
05/15/2022	1	4.000%	15,000	0	0	0	20,500	0	20,500	-5,500	1.4x
05/15/2022	1	5.000%	4,090	570	5	575	5,500	0	6,075	-,1,985	1.5x
05/15/2023	1	5.000%	4,280	505	1,650	2,155	4,780	0	6,935	-2,655	1.6x
05/15/2024	1	5.000%	6,260	770	0	770	5,000	0	5,770	490	92%
05/15/2025	1	5.000%	6,510	675	150	825	5,000	0	5,825	685	89%
05/15/2026	1	5.000%	6,800	60	100	160	5,000	0	5,160	1,640	76%
05/15/2027	1	5.000%	7,110	2,000	0	2,000	14,000	0	16,000	-8,890	2.3x
05/15/2028	1	2.250%	7,395	6,500	0	6,500	6,000	7,000	19,500	-12,105	2.6x
05/15/2029	1	2.500%	7,480	3,750	0	3,750	3,000	0	6,750	730	90%
05/15/2030	1	4.000%	7,630	4,600	0	4,600	6,000	0	10,600	-2,970	1.4x
05/15/2031	1	4.000%	7,870	2,750	0	2,750	14,370	0	17,120	-9,250	2.2x
05/15/2032	1	4.000%	17,660	4,000	0	4,000	10,000	0	14,000	3,660	79%
05/15/2033	1	4.000%	18,315	4,000	0	4,000	19,500	5,000	28,500	-10,185	1.6x
07/01/2033	2	5.000%	10,000	0	1,500	1,500	0	0	1,500	8,500	15%
05/15/2034	1	3.000%	16,420	1,000	1,000	2,000	35,000	0	37,000	-20,580	2.3x
05/15/2035	1	3.000%	16,920	1,000	0	1,000	26,000	10,000	37,000	-20,080	2.2x
05/15/2037	1	3.000%	20,110	10,000	0	10,000	32,000	0	42,000	-21,890	2.1x

1310

1300

FIG. 13

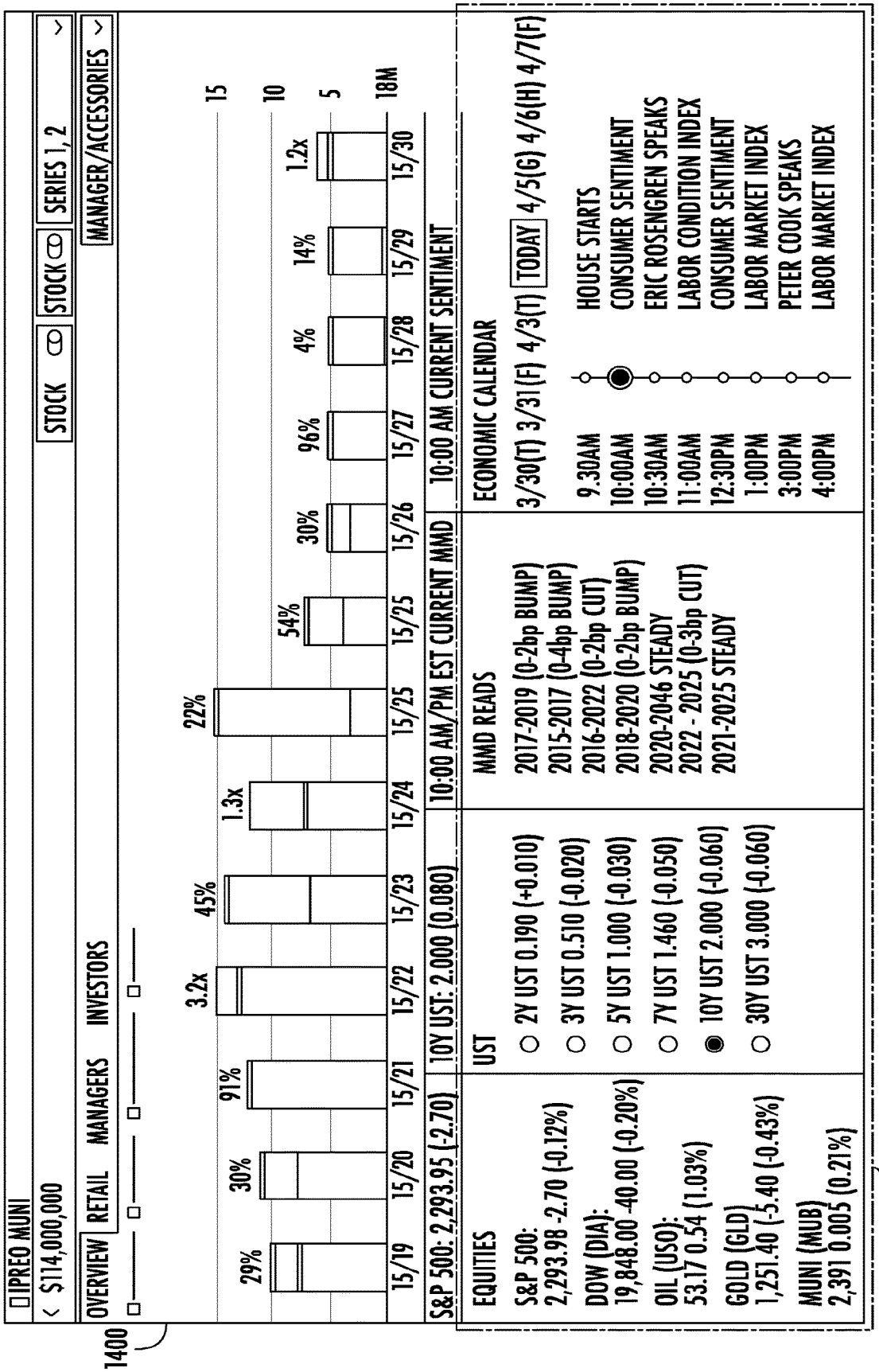

IPREO MUNI
< $114,000,000
STOCK
STOCK
SERIES 1, 2
OVERVIEW
RETAIL
MANAGERS
INVESTORS
MANAGER/ACCESSORIES
15
10
5
18M
29%
30%
91%
3.2x
45%
1.3x
22%
54%
30%
96%
4%
14%
1.2x
15/19
15/20
15/21
15/22
15/23
15/24
15/25
15/25
15/26
15/27
15/28
15/29
15/30
S&P 500: 2,293.95 (-2.70)
10Y UST: 2.000 (0.080)
10:00 AM/PM EST CURRENT MMD
10:00 AM CURRENT SENTIMENT
EQUITIES
S&P 500:
2,293.98 -2.70 (-0.12%)
DOW (DIA):
19,848.00 -40.00 (-0.20%)
OIL (USO):
53.17 0.54 (1.03%)
GOLD (GLD)
1,251.40 (-5.40 (-0.43%)
MUNI (MUB)
2,391 0.005 (0.21%)
UST
2Y UST 0.190 (+0.010)
3Y UST 0.510 (-0.020)
5Y UST 1.000 (-0.030)
7Y UST 1.460 (-0.050)
10Y UST 2.000 (-0.060)
30Y UST 3.000 (-0.060)
MMD READS
2017-2019 (0-2bp BUMP)
2015-2017 (0-4bp BUMP)
2016-2022 (0-2bp CUT)
2018-2020 (0-2bp BUMP)
2020-2046 STEADY
2022 - 2025 (0-3bp CUT)
2021-2025 STEADY
ECONOMIC CALENDAR
3/30(T) 3/31(F) 4/3(T) TODAY 4/5(G) 4/6(H) 4/7(F)
9:30AM HOUSE STARTS
10:00AM CONSUMER SENTIMENT
10:30AM ERIC ROSENGREN SPEAKS
11:00AM LABOR CONDITION INDEX
12:30PM CONSUMER SENTIMENT
1:00PM LABOR MARKET INDEX
3:00PM PETER COOK SPEAKS
4:00PM LABOR MARKET INDEX
1400
1410

FIG. 14

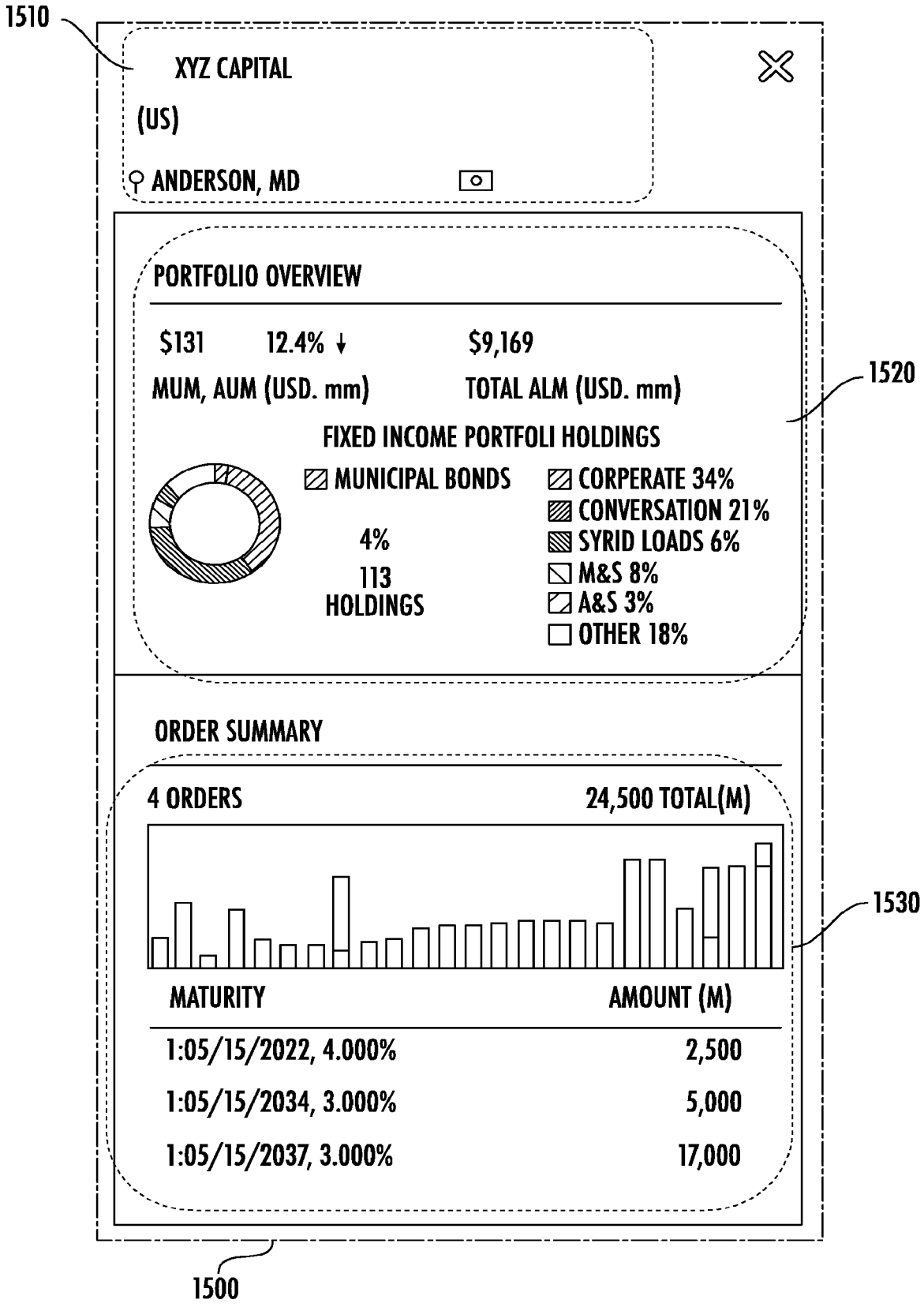

1510
XYZ CAPITAL
(US)
ANDERSON, MD
PORTFOLIO OVERVIEW
$131
12.4%
$9,169
MUM, AUM (USD. mm)
TOTAL ALM (USD. mm)
1520
FIXED INCOME PORTFOLI HOLDINGS
MUNICIPAL BONDS
4%
113
HOLDINGS
CORPERATE 34%
CONVERSATION 21%
SYRID LOADS 6%
M&S 8%
A&S 3%
OTHER 18%
ORDER SUMMARY
4 ORDERS
24,500 TOTAL(M)
1530
MATURITY
AMOUNT (M)
1:05/15/2022, 4.000%
2,500
1:05/15/2034, 3.000%
5,000
1:05/15/2037, 3.000%
17,000
1500

FIG. 15

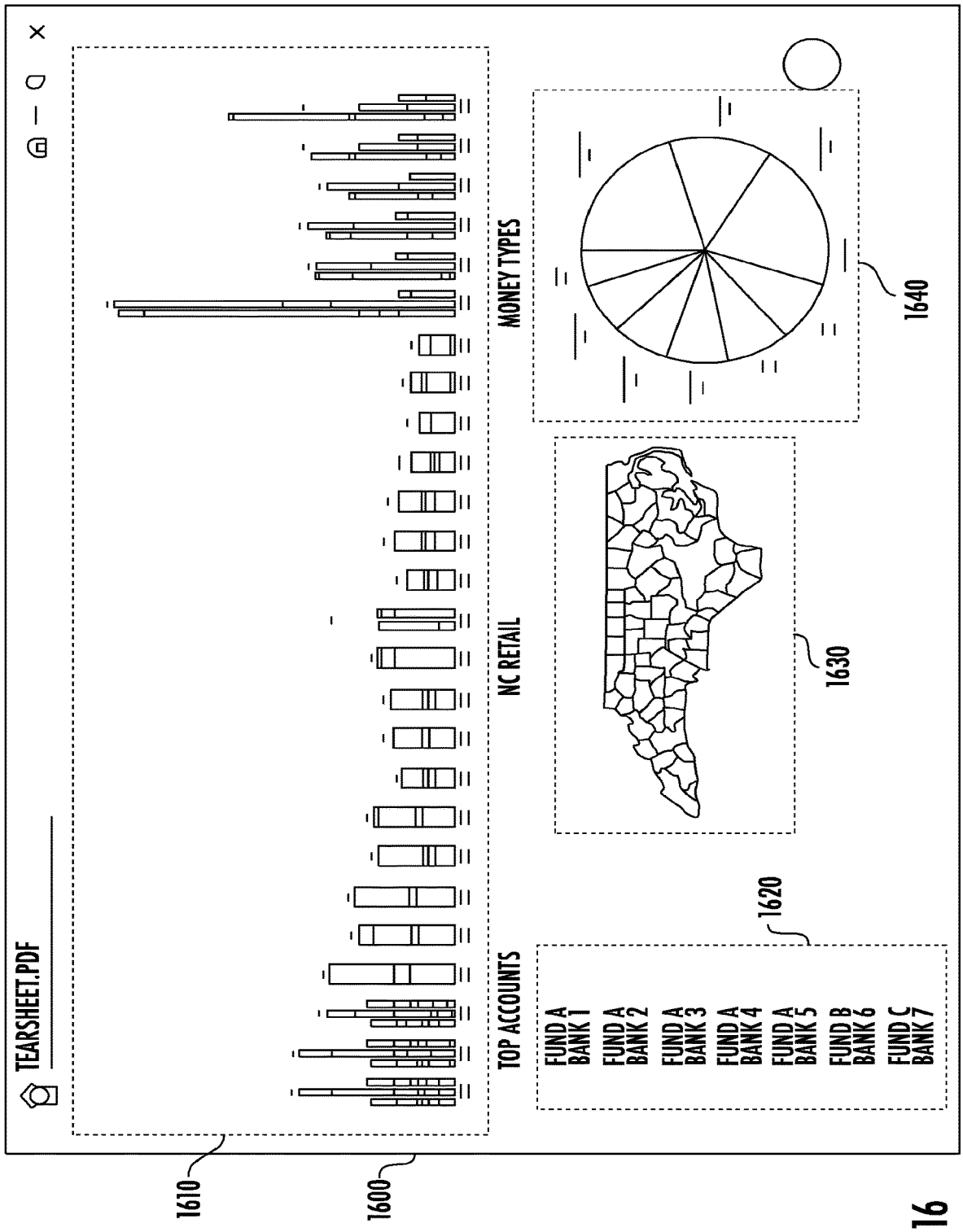

TEARSHEET.PDF
TOP ACCOUNTS
FUND A BANK 1
FUND A BANK 2
FUND A BANK 3
FUND A BANK 4
FUND A BANK 5
FUND B BANK 6
FUND C BANK 7
1620
NC RETAIL
1630
MONEY TYPES
1640
1610
1600

FIG. 16

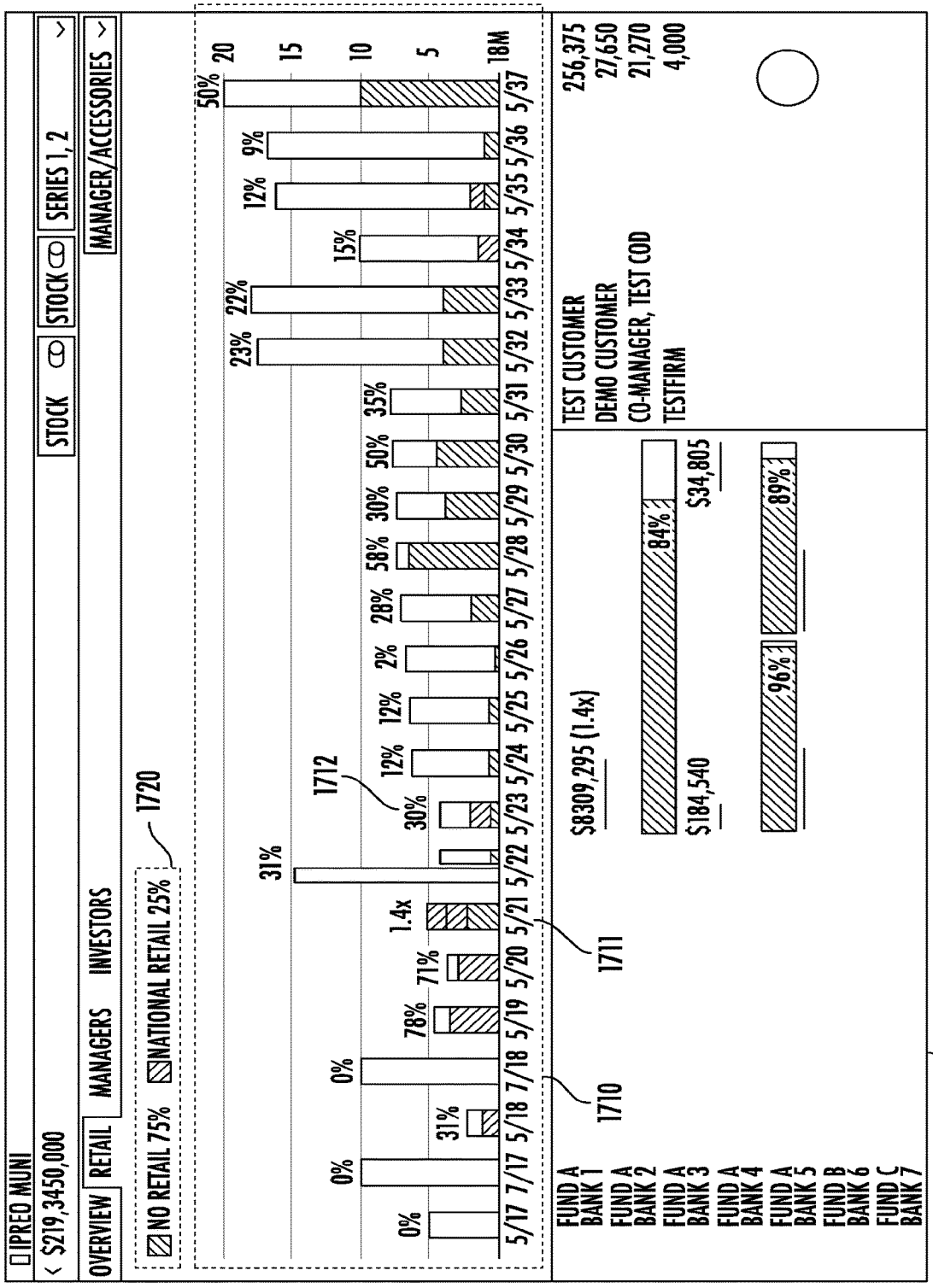

IPREO MUNI
$219,3450,000
STOCK
STOCK
SERIES 1, 2
OVERVIEW
RETAIL
MANAGERS
INVESTORS
MANAGER/ACCESSORIES
NO RETAIL 75%
NATIONAL RETAIL 25%
1720
1712
1711
1710
1700
$8309,295 (1.4x)
$184,540
$34,805
84%
96%
89%
TEST CUSTOMER 256,375
DEMO CUSTOMER 27,650
CO-MANAGER, TEST COD 21,270
TESTFIRM 4,000
FUND A BANK 1
FUND A BANK 2
FUND A BANK 3
FUND A BANK 4
FUND A BANK 5
FUND B BANK 6
FUND C BANK 7

FIG. 17

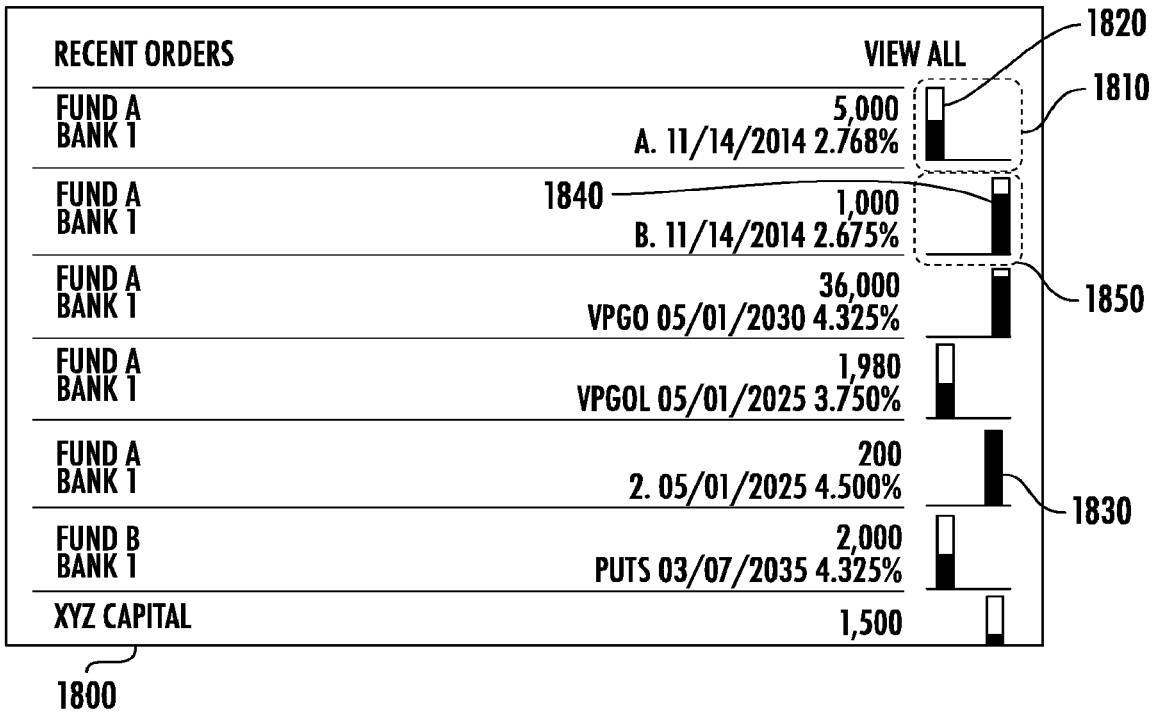

RECENT ORDERS
VIEW ALL
FUND A
BANK 1
5,000
A. 11/14/2014 2.768%
FUND A
BANK 1
1,000
B. 11/14/2014 2.675%
FUND A
BANK 1
36,000
VPGO 05/01/2030 4.325%
FUND A
BANK 1
1,980
VPGOL 05/01/2025 3.750%
FUND A
BANK 1
200
2. 05/01/2025 4.500%
FUND B
BANK 1
2,000
PUTS 03/07/2035 4.325%
XYZ CAPITAL
1,500
1800
1810
1820
1830
1840
1850

FIG. 18

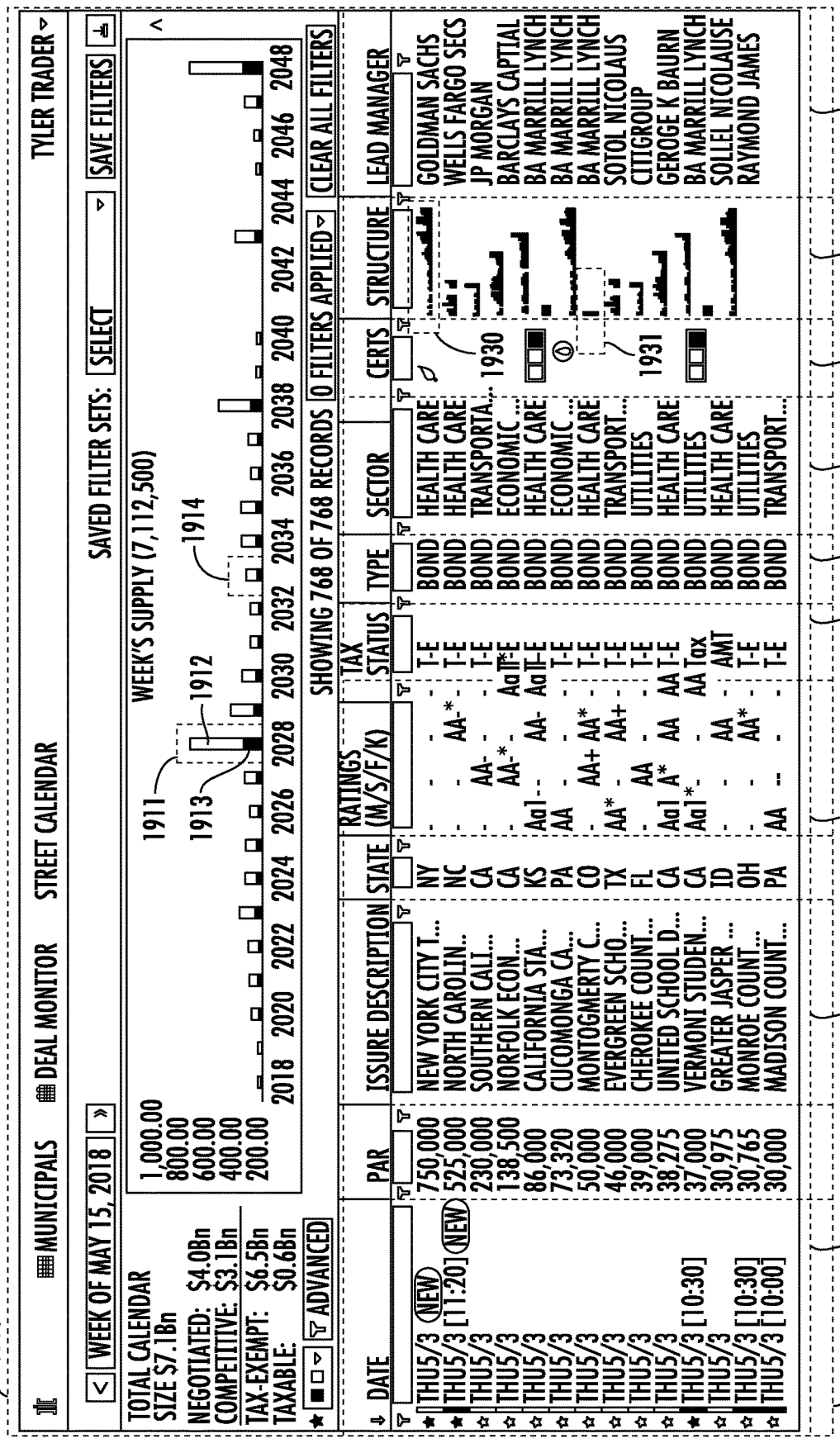
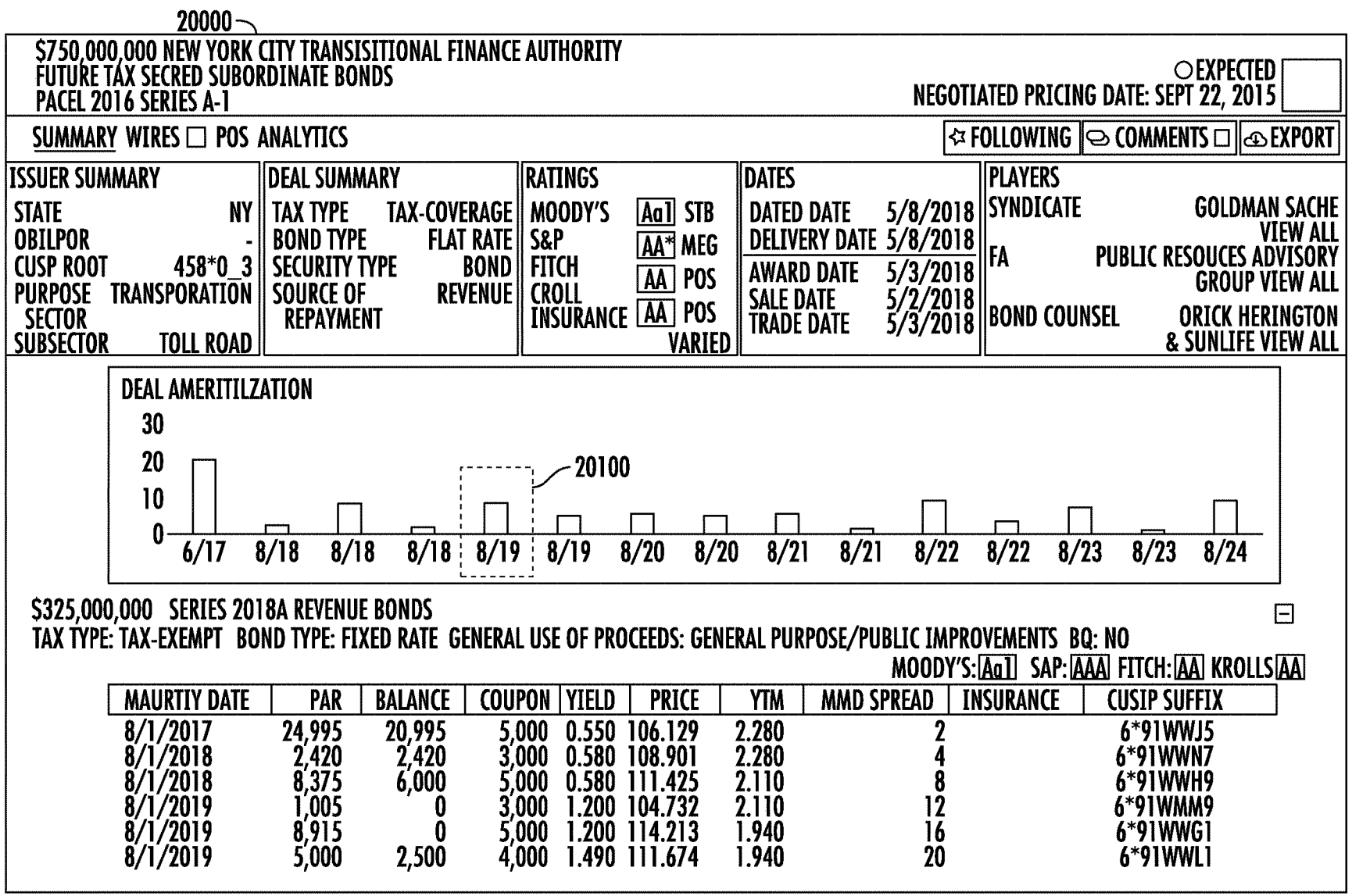
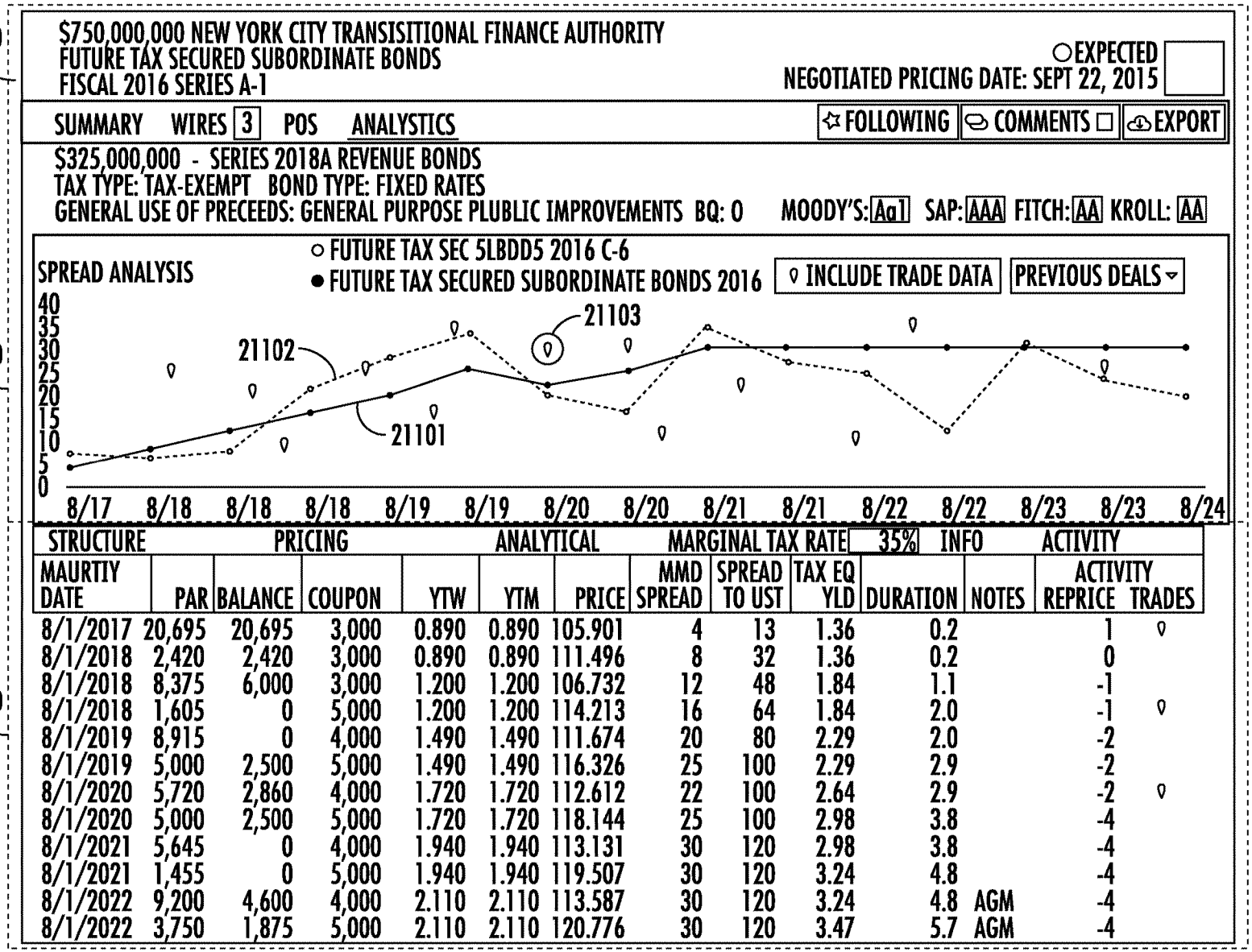

1900
1910
MUNICIPALS
DEAL MONITOR
STREET CALENDAR
TYLER TRADER
WEEK OF MAY 15, 2018
SAVED FILTER SETS:
SELECT
SAVE FILTERS
TOTAL CALENDAR SIZE $7.1Bn
NEGOTIATED: $4.0Bn
COMPETITIVE: $3.1Bn
TAX-EXEMPT: $6.5Bn
TAXABLE: $0.6Bn
ADVANCED
WEEK'S SUPPLY (7,112,500)
1,000.00
800.00
600.00
400.00
200.00
2018 2020 2022 2024 2026 2028 2030 2032 2034 2036 2038 2040 2042 2044 2046 2048
1911
1912
1913
1914
SHOWING 768 OF 768 RECORDS
0 FILTERS APPLIED
CLEAR ALL FILTERS
DATE
PAR
ISSURE DESCRIPTION
STATE
RATINGS (M/S/F/K)
TAX STATUS
TYPE
SECTOR
CERTS
STRUCTURE
LEAD MANAGER
THU5/3 (NEW)
THU5/3 [11:20] (NEW)
THU5/3
THU5/3
THU5/3
THU5/3
THU5/3
THU5/3
THU5/3
THU5/3
THU5/3 [10:30]
THU5/3
THU5/3 [10:30]
THU5/3 [10:00]
750,000 NEW YORK CITY T... NY - - - T-E BOND HEALTH CARE GOLDMAN SACHS
525,000 NORTH CAROLIN.. NC - - AA-* - T-E BOND HEALTH CARE WELLS FARGO SECS
230,000 SOUTHERN CALI... CA - AA- - - T-E BOND TRANSPORTA... JP MORGAN
138,500 NORFOLK ECON... CA - AA-* - Aa TE BOND ECONOMIC... BARCLAYS CAPTIAL
86,000 CALIFORNIA STA... KS Aa1 -- AA- Aa TE BOND HEALTH CARE BA MARRILL LYNCH
73,320 CUCOMONGA CA... PA AA - - - T-E BOND ECONOMIC... BA MARRILL LYNCH
50,000 MONTOGMERTY C... CO - AA+ AA* - T-E BOND HEALTH CARE BA MARRILL LYNCH
46,000 EVERGREEN SCHO... TX AA* - AA+ - T-E BOND TRANSPORT... SOTOL NICOLAUS
39,000 CHEROKEE COUNT... FL - AA - - T-E BOND UTILITIES CITIGROUP
38,275 UNITED SCHOOL D... CA Aa1 A* AA AA T-E BOND HEALTH CARE GEROGE K BAURN
37,000 VERMONT STUDEN... CA Aa1 -- - AA Tax BOND UTILITIES BA MARRILL LYNCH
30,975 GREATER JASPER ... ID - - AA - AMT BOND HEALTH CARE SOLLEL NICOLAUSE
30,765 MONROE COUNT... OH - - AA* - T-E BOND UTILITIES RAYMOND JAMES
30,000 MADISON COUNT... PA AA -- - - T-E BOND TRANSPORT...
1920
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
1931

FIG. 19



MAURTIY DATE	PAR	BALANCE	COUPON	YIELD	PRICE	YTM	MMD SPREAD	INSURANCE	CUSIP SUFFIX
8/1/2017	24,995	20,995	5,000	0.550	106.129	2.280	2		6*91WWJ5
8/1/2018	2,420	2,420	3,000	0.580	108.901	2.280	4		6*91WWN7
8/1/2018	8,375	6,000	5,000	0.580	111.425	2.110	8		6*91WWH9
8/1/2019	1,005	0	3,000	1.200	104.732	2.110	12		6*91WMM9
8/1/2019	8,915	0	5,000	1.200	114.213	1.940	16		6*91WWG1
8/1/2019	5,000	2,500	4,000	1.490	111.674	1.940	20		6*91WWL1

FIG. 20



STRUCTURE		PRICING			ANALYTICAL		MARGINAL TAX RATE 35%		INFO		ACTIVITY	
MAURTIY DATE	PAR	BALANCE	COUPON	YTW	YTM	PRICE	MMD SPREAD	SPREAD TO UST	TAX EQ YLD	DURATION	NOTES	ACTIVITY REPRICE	TRADES
8/1/2017	20,695	20,695	3,000	0.890	0.890	105.901	4	13	1.36	0.2		1	
8/1/2018	2,420	2,420	3,000	0.890	0.890	111.496	8	32	1.36	0.2		0	
8/1/2018	8,375	6,000	3,000	1.200	1.200	106.732	12	48	1.84	1.1		-1	
8/1/2018	1,605	0	5,000	1.200	1.200	114.213	16	64	1.84	2.0		-1	
8/1/2019	8,915	0	4,000	1.490	1.490	111.674	20	80	2.29	2.0		-2	
8/1/2019	5,000	2,500	5,000	1.490	1.490	116.326	25	100	2.29	2.9		-2	
8/1/2020	5,720	2,860	4,000	1.720	1.720	112.612	22	100	2.64	2.9		-2	
8/1/2020	5,000	2,500	5,000	1.720	1.720	118.144	25	100	2.98	3.8		-4	
8/1/2021	5,645	0	4,000	1.940	1.940	113.131	30	120	2.98	3.8		-4	
8/1/2021	1,455	0	5,000	1.940	1.940	119.507	30	120	3.24	4.8		-4	
8/1/2022	9,200	4,600	4,000	2.110	2.110	113.587	30	120	3.24	4.8	AGM	-4	
8/1/2022	3,750	1,875	5,000	2.110	2.110	120.776	30	120	3.47	5.7	AGM	-4	

FIG. 21

GRAPHICAL USER INTERFACE TO TRACK DYNAMIC DATA

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation application of U.S. application Ser. No. 17/319,715, filed May 13, 2021, which is a continuation application of U.S. application Ser. No. 16/783,014, filed Feb. 5, 2020, which is a continuation-in-part application of U.S. application Ser. No. 16/407,069, filed May 8, 2019, which is a continuation application of U.S. application Ser. No. 15/815,329, filed Nov. 16, 2017, which claims priority to U.S. Provisional Patent Application Ser. No. 62/424,239, filed Nov. 18, 2016, all of which are hereby incorporated by reference in their entirety for all purposes.

TECHNICAL FIELD

The present invention relates to graphical user interfaces and, more particularly, to systems and methods for monitoring multiple transactions via a centralized and specifically designed graphical user interface.

BACKGROUND

User interfaces for securities syndicate issuer applications have been historically very data driven. Conventional and existing user interfaces display securities syndicate data using columns and/or rows of data and text. Security syndicate issuers typically monitor transactions as they are occurring. High-pressure environments, where time is of the essence, causes the visual representations of the data to be essential on a transaction or offering day.

FIG. **1** illustrates a conventional graphical user interface with tabular data. FIG. **1** illustrates a graphical user interface display (GUI **100**) of an Industrial Development Board in a city, such as Indianapolis, Indiana. GUI **100** displays the amount of the bonds in each maturity as well as the orders received in a tabular form. A lead manager or an issuer acting as a user, for example, may indicate to the system or request to categorize the data by case, priority, total member, non-retail or other desired category. The user may then have to view additional details in each category and extract the underlying data.

For example, as illustrated in FIG. **1**, different maturities are presented in rows. Under Series 2016A (in section **120**), the GUI **100** presents a maturity date of December 2035 on the first line. Further, more information is presented within the row of that maturity. For example, GUI **100** only lists the amount of bonds and the coupon rate (e.g., for the December 2035 maturity, 27,635 bonds have been sold with a coupon rate of 5). This data is tabular and time consuming to digest for a manager or an issuer. Issuers are often required to assess an overall status of a portfolio in a very short period of time (e.g., three to five second test where the issuer has to assess a portfolio in three to five seconds). Given the amount and complexity of transaction data presented in GUI **100**, it is nearly impossible to visually analyze a portfolio when the data is presented using conventional methods.

Furthermore, modern users of electronic devices access their electronic devices for larger durations and with smaller screens. For example, social media has caused users of various systems to access their devices and webpages for hours at a time on portable electronic devices. Security syndicate issuers may similarly use their electronic devices, such as cell phones and laptops, for longer viewing periods. Conventional user interfaces that display all data in a tabular form may become difficult and inefficient to use because tabular data is more challenging to view on smaller screens.

SUMMARY

For the aforementioned reasons, there is a desire to graphically present the information in real time in an easy-to-digest form so that syndicate issuers and/or managers can view the data live in an efficient manner consistent with demands of the financial transaction trading industry.

In an embodiment, a method of displaying a graphical user interface on an electronic device, the method comprises displaying, by a server, in a first section of the graphical user interface, a plurality of selectable graphical components representing a plurality of maturity bonds of an offering, wherein each selectable graphical component represents a maturity bond from the plurality of maturity bonds, wherein each selectable component corresponds to at least one attribute associated with each maturity bond, the attribute comprising at least one of a name, date, credit rating, par amount, and sector associated with each maturity bond, and wherein when a user interacts with a first graphical component corresponding to a first maturity bond, the server dynamically updates a second section of the graphical user interface; displaying, by the server, in the second section of the graphical user interface, a plurality of time periods corresponding to a maturity date for the first maturity bond, wherein the server displays a vertical bar for each time period, a height of the vertical bar indicating a value of the maturity bond, wherein each vertical bar is divided into two areas a first area corresponding to a competitive sale of the first maturity bond; and a second area corresponding to a negotiated sale of the first maturity bond, wherein the server periodically monitors one or more offers associated with the first maturity bond and dynamically updates the second section of the graphical user interface.

In another embodiment, a computer system for displaying a graphical user interface on an electronic device, the computer system comprises the electronic device configured to display a graphical user interface; and a server in communication with the electronic device, the server configured to display in a first section of the graphical user interface, a plurality of selectable graphical components representing a plurality of maturity bonds of an offering, wherein each selectable graphical component represents a maturity bond from the plurality of maturity bonds, wherein each selectable component corresponds to at least one attribute associated with each maturity bond, the attribute comprising at least one of a name, date, credit rating, par amount, and sector associated with each maturity bond, and wherein when a user interacts with a first graphical component corresponding to a first maturity bond, the server dynamically updates a second section of the graphical user interface; display in the second section of the graphical user interface, a plurality of time periods corresponding to a maturity date for the first maturity bond, wherein the server displays a vertical bar for each time period, a height of the vertical bar indicating a value of the maturity bond, wherein each vertical bar is divided into two areas a first area corresponding to a competitive sale of the first maturity bond; and a second area corresponding to a negotiated sale of the first maturity bond, wherein the server periodically monitors one or more offers associated with the first maturity bond and dynamically updates the second section of the graphical user interface.

It is to be understood that both the foregoing general description and the following detailed description are and explanatory and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings constitute a part of this specification and illustrate an embodiment of the invention and together with the specification, explain the invention.

FIG. **1** illustrates a conventional graphical user interface displaying transaction data, according to an embodiment.

FIG. **2** illustrates an embodiment of a trading system for bond trading, according to an embodiment.

FIG. **3** illustrates an embodiment of fixed income pricing system (FIPS), according to an embodiment.

FIGS. **4**A-C illustrate a transaction monitoring computer system, according to an embodiment.

FIG. **5** illustrates steps performed when monitoring the flow of transactions during a security offering, according to an embodiment.

FIG. **6** illustrates steps performed when monitoring the flow of transactions during a security offering, according to an embodiment.

FIG. **7** illustrates a graphical user interface displaying offering data, according to an embodiment.

FIG. **8** illustrates a graphical user interface displaying offering data, according to an embodiment.

FIG. **9** illustrates a graphical user interface displaying offering data, according to an embodiment.

FIG. **10** illustrates a graphical user interface displaying offering data, according to an embodiment.

FIG. **11** illustrates a graphical user interface displaying offering data, according to an embodiment.

FIG. **12** illustrates multiple graphical user interfaces displaying offering data using a client's customized graphical user interface, according to an embodiment.

FIG. **13** illustrates a graphical user interface displaying offering data in a tabular form, according to an embodiment.

FIG. **14** illustrates a graphical user interface displaying offering data and additional economic data, according to an embodiment.

FIG. **15** illustrates a pop up graphical user interface component displaying manager profiles, according to an embodiment.

FIG. **16** illustrates a graphical user interface displaying offering data and geographic analysis of the order, according to an embodiment.

FIG. **17** illustrates a graphical user interface displaying customized offering data, according to an embodiment.

FIG. **18** illustrates a graphical user interface component that displays the orders received, according to an embodiment.

FIG. **19** illustrates a graphical user interface displaying customized offering data, according to an embodiment.

FIG. **20** illustrates a graphical user interface displaying customized offering data, according to an embodiment.

FIG. **21** illustrates a graphical user interface displaying customized offering data, according to an embodiment.

DETAILED DESCRIPTION

There are various types of security syndicate offerings conducted in the securities market. One type of security syndicate offering, for example, involves the sale of municipal bonds. During a security syndicate offering of municipal bonds, various transactions are conducted to solicit bids for, and facilitate the sale of the municipal bonds. These transactions can be very complex and time-consuming because the security syndicate offering can be valued at, for example, over one billion Dollars and may include multiple interconnected offerings and deals. Furthermore, processing the security syndicate offering requires interaction between a large number of participants. In general, the participants consist of the syndicate group, financial institutions, underwriters, etc. The syndicate group typically pool their resources to share the underwriting liability for a given security syndicate offering by a security issuer.

A security syndicate offering can include, for example, four general transaction periods, namely communication, pricing, order, and allotment. During the communication period, information regarding the details of the security syndicate offering, for example, is communicated to all members of the syndicate. Once the information has been received, the syndicate members make a commitment to purchase a portion of the transaction value. The pricing period represents, for example, the time it takes to negotiate or otherwise arrive at the terms for purchasing the security syndicates. For example, the terms can include the interest rates, maturities, etc. The order period begins after the pricing. During the order period, the syndicate members use their sales forces to contact financial institutions, asset managers, individual investors, etc. to solicit orders for the sale of the security syndicates. Finally, there is the allotment period, wherein a syndicate manager makes a decision as to which orders will be filled (e.g., processed). This is necessary because there are times when the syndicate members receive more orders than the value of the security syndicate offering.

Transactions conducted during the security syndicate offering can have various degrees of importance to both syndicate and non-syndicate members. One such party (or member) is the security syndicate issuer. The issuer is the person, entity, municipality, etc. offering the security syndicates for sale. The issuer is particularly interested in the order period. The order period can provide an indication of how the security syndicates are selling. This will allow the issuer to know if the security syndicates were appropriately priced and whether the syndicate members will be able to complete the sale of the security syndicate offering.

Traditionally, the issuer would periodically contact a lead syndicate member (e.g., a senior manager) and request an update on the number of bonds that have been sold. Availability of a senior manager depends on the type of security syndicate offering. In a negotiated bond offering, for example, there is only one senior manager responsible for overseeing the entire deal. In a competitive bond offering, multiple senior managers can share responsibility for overseeing the deal.

The frequency with which the issuer contacts the senior manager depends, in part, on the particular issuer. For example, one issuer may contact the senior manager two or three times throughout the day, while another issuer may contact the senior manager every hour or even more frequently. Another factor affecting the issuer is the speed at which the bonds are being sold. For example, the same issuer may contact a senior manager more frequently if the bonds do not appear to be selling quickly. In competitive deals, the issuer may contact multiple, or all, senior managers to determine status information on the deal.

The process of contacting a senior manager (or multiple senior managers) can be very time-consuming and tedious. For example, the senior manager must be prepared to provide updated information regarding sale of the bonds.

Since the information may be changing dynamically, the senior manager must also devote time to tabulating the information. Consequently, resources will not be available to market and solicit the sale of bonds.

Various electronic systems currently exist for trading bonds and managing transactions associated with bond trading. For example, U.S. Pat. No. 5,915,209 (the '209 patent) to Lawrence, incorporated herein by reference in its entirety, discloses a computer-implemented bond trading system. The system attempts to facilitate a private auction of bids between a central brokers' broker and multiple prospective bidders and to maintain a reference database of accurate bond lot descriptions.

Reference will now be made to the embodiments illustrated in the drawings, and specific language will be used here to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended. Alterations and further modifications of the inventive features illustrated here, and additional applications of the principles of the inventions as illustrated here, which would occur to a person skilled in the relevant art and having possession of this disclosure, are to be considered within the scope of the invention.

The various illustrative logical blocks, modules, circuits, and algorithm steps described in connection with the embodiments disclosed herein may be implemented as electronic hardware, computer software, or combinations of both. To illustrate this interchangeability of hardware and software, various illustrative components, blocks, modules, circuits, and steps have been described above generally in terms of their functionality. Whether such functionality is implemented as hardware or software depends upon the particular application and design constraints imposed on the overall system. Skilled artisans may implement the described functionality in varying ways for each particular application, but such implementation decisions should not be interpreted as causing a departure from the scope of the present invention.

FIG. **2** is an embodiment of a system for bond trading. As illustrated in FIG. **2**, a software-enabled, computer-implemented municipal bond trading system **210** is provided for use by SEC-registered municipal bond brokers firms to serve the community of SEC-registered securities brokerage firms who deal with the public, such as selling traders **214** and buying traders **212**, for executing transactions in unlisted securities, especially municipal bonds, without disclosing the seller to the prospective buyer. The municipal bond trading system **210** enables a broker who deploys it to perform a centralized market-making function in a manner providing many of the advantages of a live exchange such as the New York Stock Exchange, without, in preferred embodiments, requiring an exchange license. Although the municipal bond trading system **210** is shown in FIG. **2** as occupying a central function between sellers such as selling trader **214** and buying traders **212**, the municipal bond trading system **210** can include components running at the premises (e.g., a software component executing on computing devices) of buying traders **212** and at the premises (e.g., a software component executing on computing devices) of selling traders **214** to integrate both sellers and prospective buyers into a coherent market-making system.

A job lot **216** comprises a list of one or more bond lots, each of which is a bid wanted, offering or a dollar bond quote. "For sale" is an industry phrase that means that a seller has accepted a bid at a level reasonably close to the lot's value and will execute on the bid. A selling trader **214**, who may be an owning institution or individual but is preferably an SEC-registered securities broker dealer, transmits one or more job lots **216** of bonds for sale to the municipal bond trading system **210** maintained by a broker, who functions as a "market-maker," at any time convenient to the selling trader **214**. Transmission of job lots **216** to the municipal bond trading system **210** can be electronically effected in a file that can be directly processed by the municipal bond trading system **210** via confidential e-mail, as are communications from the market maker to the seller, over data lines **215**. The seller can be computer-linked to the municipal bond trading system **210** on a LAN or a WAN.

After appropriate central processing employing the municipal bond trading system **210**, bid wanted forms are circulated to buying traders **212** in order to solicit bids **218**. Bids **218** are received from one or more buying traders **212** and transmitted to the seller by any suitable means, such as electronic transmission to the seller's computer device. If the selling trader **214** accepts the bid **218**, the brokers' broker marks the lot "for sale" and completes the execution, preferably with the assistance of the municipal bond trading system **210**, and then transmits customary buy and sell tickets to the selling trader **214** for their internal processing. If traders are utilizing the system on their workstations, they will execute a "buy" utilizing the program while the broker executes a "sell."

The municipal bond trading system **210** can be operated as an exchange, providing a direct transaction between a selling trader **214** and a buying trader **212**, conducted through the intermediary of the municipal bond trading system **210**. The double step required in conducting a buy-sell transaction with both the selling trader **214** and the buying trader **212**, could be eliminated. The municipal bond trading system **210** may also receive bid-wanted forms in electronic form, without vocal communication, and system-select the best bid for entry and referral to the selling trader **214** for acceptance, which electronic non-vocal automated trading procedure currently requires an exchange license. The municipal bond trading system **210** can be tailored to transmit information of the transaction to the trader's in-house processing system for proper record keeping and accounting and to maintain an inventory of bond lots in position for the trader.

The municipal bond trading system **210** herein facilitates fulfillment of this requirement by enabling rapid distribution of job lots **216** to a wide base of customers, selling traders, and by providing quick and efficient means for evaluating, collating and transmitting even a large number of bids **218** to the seller for further action. Before a trade is executed, a municipal bond lot must be identified with a Central Unified Security Identification Process number, herein referred to as "CUSIP (trademark)" issue identification number. CUSIP is a registered trademark of the American Bankers Association ("ABA"). The bond lot must also have an authentic description and a par value, usually some thousands of dollars, describing the size of the lot. Unlisted bond descriptions are subject to change at any time. For example, bond ratings are continually changed by rating agencies, and a bond may be called in for repayment on as little as thirty days' notice. Ratings and calls are an essential part of the description of a security and can dramatically affect the character of the investment. It is accordingly highly desirable to include such changes of description in each bid wanted form before distributing it, which presents a problem.

To provide contemporaneous descriptions rapidly, in a manner suitable for processing lots in volume, a security master database **224** is provided, wherein bond descriptions are stored cumulatively, whenever the municipal bond trad-

ing system **210** encounters them, to be available for future use. The security master database **224** can be primed or supplemented with preferred lists of bond descriptions and has no particular limits, but it is much smaller than the reference database **222**, thus enabling a faster search and access capability. For municipal bond trading, the reference database **222** is preferably the KIS database.

Once prepared, the bid wanted form **226** is distributed to the buying traders **212** to enable them to bid in a timely manner. Bids are first solicited, and if necessary, collected centrally, and then evaluated to determine the high bidder. Following this process, a compilation of bids is transmitted to the selling trader **214** for action. These steps are accomplished in a silent auction, conducted electronically or on paper without the necessity of voiced person-to-person communication modes, such as telephone calls. In this silent auction, each bid wanted is provided with a bidding deadline and is broadcast to reach multiple buying traders **212** prior to that bidding deadline. Buying traders **212** wishing to bid on the lot offered are required to return a completed bid wanted form **228** to the municipal bond trading system **210** prior to the deadline if the bid is to be considered. Bidding closes when the deadline passes. After acceptance of a high bid by the selling trader **214** and the completion of any closing formalities, a bought-from ticket **234** is system-prepared and transmitted to the buyer for their records and processing, preferably electronically.

Buying traders **212** are linked to the municipal bond trading system **210** over a computer network so that bidding deadline alerts can be overlaid, or otherwise displayed on a buying trader's screen at various times throughout the auction process to advise of the approaching commencement of an auction on a particular lot, to warn of expiration of the time limit, and to provide interim advisories as the auction proceeds. Such alerts are preferably displayed on a system-wide basis on all selected and operational networked screens including those of brokers working with other applications on-screen at the time. If desired, bidding trader modules of the municipal bond trading system **210** can include switches or filters permitting the user to choose which alerts should be flashed on-screen or which should be allowed to interrupt other applications.

An on-screen bidding advisory message requires action by the buying trader **212** to remove it, such as pressing a particular key, and the advisory may include options (e.g., "Display bid wanted form?") if the form is not already on-screen. The system utilizes electronic transmissions of bid wanted forms **226** to a specified group of buying traders **212** who can receive the bid wanted form **226** electronically. This method of transmission is also suitable for distributing bid wanted forms **226** to any buying trader **212**. In preparing job lots **216** for electronically broadcasting, the municipal bond trading system **210** organizes all active job lots **216** in a queue so that the broker can designate, or "tag," selected lots for electronic transmission. The system sorts the tagged lots for electronic transmission by auction time, and transmits them at predetermined interval before the auction commences.

The bid wanted form **226** contains the full particulars of each bid wanted lot, including its CUSIP (trademark) number and description, state of origin, maturity, par amount, and coupon values (yield and concession particulars, net yields, and dollar, gross and net dollar price) if appropriate. For use in an electronic marketing system, the form preferably also includes blank online forms to be completed by a bidding trader with bid particulars, yield, dollar or other amount, as appropriate, and bidder identifiers, including the name of the bidding trader. Yields and other calculable values can of course be system-calculated and automatically posted from base data. A buying trader **212** can quickly write minimal bid information on a hard copy of such a bid wanted form **226**, sign it, and electronically transmit it back to the market-maker, who receives a signed bid with full and accurate lot particulars complying with regulatory requirements and which does not need to be checked, verified or completed.

U.S. Pat. No. 5,809,483 issued to Broka et al., incorporated herein by reference, discloses an on-line transaction processing system for bond trading. The system allows for monitoring of information regarding debt securities and reporting trades in the debt securities market. FIG. **3** is a reproduction of an embodiment of fixed income pricing system (FIPS) as disclosed in the '483 patent.

As shown in FIG. **3**, the FIPS processing system **300** includes business functions layer **310**, infrastructure layer **320**, and platforms layer **360**. Business functions layer **310** provides the basic services accessed by users and includes the following services: trade reports **311**, market services control **312**, quotes **313**, issues **314**, news **315**, participants & users **316**, and statistics **317**.

Infrastructure layer **320** includes the communication mechanisms and other tools that allow the various FIPS processes to work together. Infrastructure layer **320** includes workstation services module **321**, network services module **330**, and host services module **340**. Workstation services module **321** includes those services required to use a workstation and include user interface management **322**, information model **323**, host connection **324**, broadcast receiver **425**, message handling **326**, logging **327**, and utilities **328**.

Network services module **330** includes those services that provide access to the entire network. These include routing **331**, message transfer **332**, and filtering **333**. Host services module **340** includes those services provided for the FIPS host and include: security service **341**, beginning-of-day & end-of-day **342**, message handling **343**, communication service **344**, broadcast service **345**, timer **346**, logging **347**, message naming **348**, bond quotation dissemination system (BDQS) **349**, computer-to-computer interface (CTCI) **350**, and standard & poor's (S&P) data loading **351**.

During most system interactions, one of the services in infrastructure layer **320** will interact with one of the functions in business functions layer **310**. For example, the security service **341** works with the participant & user **316** to authorize and authenticate users when they log on. Different services in infrastructure layer **320** may also communicate with each other. For example, the broadcast service **345** works with the communication service **344** to send messages to multiple platforms including PC/Windows **461** and Sun/Unix **462**. Business functions layer **310** can have relationships with each other as well. For example, FIPS system administrators may use market service control **312** with the trade reports **311** to restrict a user's ability to generate trade reports.

The previously described features are beneficial for addressing specific problems in the financial market. For example, FIG. **3** addresses problems associated with monitoring debt security information and reporting trades in the debt securities market. Embodiments allow an issuer to view (on a computing device) the progress of sales of security syndicates or access information conventionally available only from a senior manager.

The detailed descriptions that follow may be presented in terms of program procedures executed on a computer or network of computers. These procedural descriptions and

representations are the means used by those skilled in the art to efficiently convey the substance of their work to others skilled in the art.

Referring now to FIG. **4**A, a transaction monitoring computer system **400** is shown for monitoring the flow of transactions during a security syndicate offering. The transaction monitoring computer system **400** (or issuer monitor) includes a security syndicate transaction computer system **410**, an issuer computer system **414**, and a senior manager computer system **418**. The senior manager computer system is in network connection with the other computing systems and devices, such as syndicate members **426**, sales/senior manager computer **420**, and sales computer devices **430**. The security syndicate transaction computer system **410** contains a plurality of subsystems, such as the illustrated webserver **412** and the processing subsystems **422***a*-**422***n* (collectively **422**). The webserver **412** may be a server configured to generate different graphical user interfaces and display them on different computing devices described herein. The processing subsystems **422** may process information pertaining to all transactions performed during the security syndicate offering (e.g., collect, analyze, and store all transaction data pertinent to the security syndicate offerings).

In an embodiment, the webserver **412** and the processing subsystems **422** each comprise a processor and a non-transitory computer readable medium comprising a set of instructions that are configured to be executed by each processor to display the graphical user interfaces described below (FIGS. **7**-**18**). Each instruction within the set of instructions may command and cause a different module of the webserver **412** or processing subsystems **422** to display a particular section or container of the graphical user interfaces described below. For example, a first instruction may instruct (e.g., command or cause) a first module of the webserver **412** to query pertinent data from the processing subsystems **422** and display a first section of a graphical user interface (e.g., GUI component **770** described in FIG. **7**); and a second instruction may instruct a second module of the webserver **412** to query pertinent data from the processing subsystems **422** and display a second section of the graphical user interface (e.g., GUI component **780** described in FIG. **7**). Although described herein as separate modules, it is intended that these modules can be configured as at least one module.

The processing subsystems **422** and the webserver **412** may be database servers comprising a processor capable of performing the various tasks and processes described herein. Non-limiting examples of the processing subsystems **422** and the webserver **412** may include a server, desktop, laptop, tablet, and the like. The processing subsystems **422** and the webserver **412** may comprise any number of computer-networking components (e.g., network interface card) that facilitate inter-device communications via the communication network **421**. One having skill in the art would appreciate that there may be any number of distinct computing devices functioning as the processing subsystems **422** or the webserver **412** in a distributed computing environment. The webserver **412** may host an online service, such as cloud-computing application service, or any other service that provide customer-facing web-based applications that collect transaction data through web-based client interactions over one or more networks such as the communication network **424**. Simply put, the processing subsystems **422** may collect and analyze transaction data and the webserver **412** may generate and display or display different graphical user interfaces on different computing devices described herein. Even though FIG. **4**A illustrates the processing subsystems **422** and the webserver **412** as separate computing features, in some embodiment, they may be functionally combined together. In other words, the security syndicate transaction computer system **410** may only comprise one server that performs as both the processing subsystems **422** and the webserver **412**. The security syndicate transaction computer system **410** can also include a computer (not shown) functioning as a server for interacting with both internal and external subsystems. In operation, the security syndicate transaction computer system **410** is a computing system (comprising multiple servers, computers, and databases) that monitors the security syndicate offering and generates multiple graphical user interfaces (described below) and display/render them on computing devise described within FIG. **4**A.

As used herein, a security syndicate refers to financial securities (or other financial instruments) offered for sale, and subsequently sold to buyers. A security syndicate offering refers to any procedure during which the security syndicates are offered for sale to generate funds and/or revenue. The financial instruments include, but are not limited to, municipal bonds, short-term bonds, long-term bonds, stocks, etc.

The issuer computer system **414** and senior manager computer system **418** comprise at least one computer system such as issuer's computer **416** (operated by an issuer) and senior manager computer **420** (operated by a senior manager) and a local database to store transaction data. The issuer computer system **414** and senior manager computer system **418** may comprise multiple computers operated by multiple issuers and managers; these computers are not all shown for clarity. The issuer's computer **416** and senior manager computer **420** may execute predetermined program commands for interfacing with the security syndicate transaction computer system **410** for participating in the security syndicate offering. Issuer's computer **416**, syndicate members **426***a*-**426***n*, sales desk computer **428**, sales computer device **430**, and senior manager computer **420** may be any electronic device suitable for displaying graphical user interfaces for a user, such as a workstation, desktop computer, laptop computer, smart phone, tablet computer, smart watch, or the like. The issuer computer system **414** and senior manager computer system **418** access the security syndicate transaction computer system **410** over the communication network **424** such as, for example, the Internet to access the graphical user interfaces provided by the security syndicate transaction computer system **410**. It should be noted, however, that various other networks could be used including, but not limited to, direct-dial closed networks, private local area networks (LANs), wide area networks (WAN), etc.

During the security syndicate offering, the issuer computer system **414** offers one or more security syndicates for sale. This offer can be presented in various forms, including an electronic message communicated to the security syndicate transaction computer system **410**. The electronic message would contain all the necessary information for processing the security syndicate offering and subsequently selling the security syndicates (e.g., financial instruments). The information may be stored on the processing subsystems **422** where it can be restrictively accessed by the senior manager computer system **418**. The webserver **412** can control the restrictive access, for example, by means of a username and password that uniquely identifies the senior manager computer system **418**. Thus, it is possible for the transaction monitoring computer system **400** to support multiple senior manager computer systems and multiple issuer computer systems simultaneously interacting with the

security syndicate transaction computer system **410**. Each senior manager computer system **418** and/or issuer computer system **414** would be restricted to viewing security syndicate offerings of which they are a part, thus addressing privacy and/or security concerns.

The senior manager computer system **418** is part of a syndicate group containing various entities. However, the senior manager computer system **418** is responsible for managing transactions that ultimately lead to the sale of the security syndicates. Consequently, the senior manager computer system **418** may be the only entity in the syndicate group that can access the security syndicate transaction computer system **410**. As previously indicated, the syndicate group includes a plurality of syndicate members **426***a*-**426***n* (collectively syndicate members **426**) that share liability for the security syndicate offering. The syndicate group can also include a sales desk computer **428** operated by the senior manager's staff for soliciting sale of the security syndicates from the security syndicate offerings. Likewise, the syndicate members **426** can include their own sales divisions **430***a*-**430***n* (collectively sales computing devices **430**) that solicit sale of the security syndicates from various institutions and/or investors. The syndicate members **426** can optionally solicit sales from the institutions directly without the use of a sales desk computer **428**.

During the security syndicate offering, all data relating to the order and/or sale of the security syndicates are transmitted to the senior manager computer system **418**. This information is subsequently transmitted from the senior manager computer system **418** across the communication network **424** (e.g., the Internet) to the security syndicate transaction computer system **410**. The senior manager computer system **418** is also capable of transmitting information regarding the security syndicate offering to the syndicate members **426** (e.g., computer device associated with each syndicate member).

The issuer computer system **414** communicates with the security syndicate transaction computer system **410** in order to monitor transactions being conducted during their particular security syndicate offerings. As previously stated, the senior manager computer system **418** transmits data corresponding to such transactions to the security syndicate transaction computer system **410**. Accordingly, this information is accessible by the issuer computer system **414** in order to monitor the security syndicate offering. The data corresponding to the transactions is preferably displayed on the issuer's computer **416** and automatically updated in real time. For example, every time the senior manager computer system **418** transmits information to the security syndicate transaction computer system **410** regarding a transaction, that data would be automatically transmitted to the issuer's computer **416** to update the records. Alternatively, the issuer computer system **414** can manually select to update information regarding the security syndicate offering. Such a procedure would cause the issuer's computer **416** to transmit a message to the security syndicate transaction computer system **410**, and access the most recently uploaded data using variety of the graphical user interfaces provided by the security syndicate transaction computer system **410**.

According to one embodiment, the issuer's computer **416** can be configured to correlate data received from the security syndicate transaction computer system **410** and generate reports that represent the progress of transactions during the security syndicate offering. The reports can be in various forms including, for example, tables, graphs, etc. In addition, the issuer's computer **416** can be optionally configured to process the data received from the security syndicate transaction computer system **410** and identify certain trends such as a reduction in the rate of orders being submitted, an increase in the rate of orders being submitted, a change in the relative distribution of orders being received, etc. The trends can be generally considered as indicators of the progress of the security syndicate offering. Based on these identified trends, the issuer computer system **414** can optionally contact the senior manager computer system **418** in order to incorporate changes designed to achieve predetermined results. For example, if an identified trend shows that the number of orders being received, or the rate at which orders are being received is going down, the issuer computer system **414** may wish to contact the senior manager computer system **418** to discuss a change in pricing that would make the security syndicates more attractive to buyers and/or investors. For example, if the security syndicates are municipal bonds, the issuer computer system **414** might suggest a reduction in the interest rate and/or a change in the maturity structure of the bonds. In essence, the issuer computer system **414** will attempt to identify negative trends (using the graphical user interfaces described below) in the sale of the security syndicates, and take appropriate steps to correct those trends. Similarly, if the issuer computer system **414** determines the rate of sale of the security syndicates to be too high, the issuer computer system **414** may contact the senior manager computer system **418** and, for example, increase the interest rate of the bonds.

In operation, the webserver **412** may be in communication with all the computing entities described herein in order to provide the latest and most accurate transaction information to all the parties. The webserver **412** may query the latest data from the processing subsystems **422** and generate a variety of graphical user interfaces (e.g., FIG. **7**-FIG. **11**) displayed on computing devices operated by the parties described herein (e.g., issuer's computer **416**). For example, the processing subsystems **422** may collect and analyze transaction prices from the issuer computer system **414** and display different graphical user interfaces on computing devices operated by the senior managers, syndicate members, and sales members. Upon receiving any modification data (e.g., a bid, order, counter offer, and the like) the processing subsystems **422** may then modify the transaction data and the webserver **412** may display a new graphical user interface (or update the same GUI in real time) using the updated transaction data and display said data on the issuer's computer **416**. The webserver **412** may continuously update the graphical user interfaces displayed on computing devices operated by different parties. In this way, all parties described herein may have access to the latest and most accurate transaction data displayed on a specifically designed easy-to-digest graphical user interface. The webserver **412** is also configured to provide raw data (presented in tabular form) upon the issuer's request.

The processing subsystems **422** are also configured to collect and store all transaction data in a local or remote database. The processing subsystems **422** may monitor all transaction modifications (price modifications by the issuer computing system **414**, bids received from the sales computing devices **430** or syndicate member **426**, and communications between all the parties described herein). The processing subsystems **422** may generate a deal dataset for each deal (e.g., syndicate offering) and store the above-mentioned data as metadata within the deal dataset. The processing subsystems **422** may also store additional data, such as an economic calendar including market conditions, price tickers, geographic location of the bidders and buyers, and the like within the above-mentioned dataset. In this way,

a party with access to a deal dataset (e.g., a deal snapshot) is able to review a thorough history of the deal from the beginning (e.g., when the issuer indicates the initial price) to the end (e.g., when the syndicate offering is terminated and maturities are sold).

Referring now to FIGS. **4**B-C, a transaction monitoring computer system **401** is shown for monitoring the flow of a deal from issuance of the deal and during a security syndicate offering of the issued deal. The computer system **401** is another embodiment of the computer systems used to issue, monitor, and purchase various deals (offerings). The computer system **401** does not deviate from the methods and systems described herein.

The transaction monitoring computer system **401** (sometimes called "investor access") may include analytic servers **432**, a deal generation system **446** (described in detail in FIG. **4**C), an IssueNet network **448**, and a buy-side system **438**, which may include investor computer device **444**, API **440**, and investor computer device **442**. The analytic servers **432** may contain a plurality of subsystems, such as the illustrated webserver **434** and the processing subsystems **436***a*-**436***n* (collectively processing subsystems **436**). The webserver **434** may be a server configured to generate different graphical user interfaces and display them on different computing devices described herein. The processing subsystems **436** may process information pertaining to all deals and transactions (e.g., collect, analyze, and store all transaction data pertinent to the security syndicate offerings) . The webserver **434** and the processing subsystems **436** are collectively referred to as the analytic servers **432**.

In an embodiment, the webserver **434** and the processing subsystems **436** each comprise a processor and a non-transitory computer readable medium comprising a set of instructions that are configured to be executed by each processor to display the graphical user interfaces described below. Each instruction within the set of instructions may command and cause a different module of the webserver **434** or processing subsystems **436** to display a particular section or container of the graphical user interfaces described below. For example, a first instruction may instruct (e.g., command or cause) a first module of the webserver **434** to query pertinent data from the processing subsystems **436** and display a first section of a graphical user interface; and a second instruction may instruct a second module of the web server **434** to query pertinent data from the processing subsystems **436** and display a second section of the graphical user interface. Although described herein as separate modules, it is intended that these modules can be configured as at least one module.

The processing subsystems **436** and the webserver **434** may be database servers comprising a processor capable of performing the various tasks and processes described herein. Non-limiting examples of the processing subsystems **436** and the webserver **434** may include a server, desktop, laptop, tablet, and the like. The processing subsystems **436** and the webserver **434** may comprise any number of computer-networking components (e.g., network interface card) that facilitate inter-device communications via the communication network **424** or the IssueNet network **448**.

There may be any number of distinct computing devices functioning as the processing subsystems **436** or the webserver **434** in a distributed computing environment. The webserver **434** may host an online service, such as cloud-computing application service, or any other service that provide customer-facing web-based applications (e.g., various graphical user interfaces described below) that collect transaction data through web-based client interactions over one or more networks such as the communication network **424**. Simply put, the processing subsystems **436** may collect and analyze transaction data and the webserver **434** may generate and display or display different graphical user interfaces on different computing devices described herein.

Even though FIG. **4**B illustrates the processing subsystems **436** and the webserver **434** as separate computing features, in some embodiment, they may be functionally combined together. In other words, the analytic servers **432** may only comprise one server that performs as both the processing subsystems **436** and the webserver **434**. The analytic servers **432** can also include a computer (not shown) functioning as a server for interacting with both internal and external subsystems. In operation, the analytic server **432** is a computing system (comprising multiple servers, computers, and databases) that monitors the issuance of a deal and the security syndicate offering and generates multiple graphical user interfaces (described below) and display/render them on computing devise described herein.

As used herein, a deal refers to financial securities (or other financial instruments or offering) offered for sale and subsequently sold to buyers (e.g., bond offering). A security syndicate offering refers to any procedure during which multiple financial institutions collaboratively market and offer various types of securities for sale to generate funds. The financial instruments include, but are not limited to, corporate bonds, municipal bonds, short-term bonds, long-term bonds, stocks, etc. Even though FIG. **4**B only illustrates only one investor computer device **444** directly in communication with the analytic servers **432**, there may be multiple investor computer devices and sales members involved in a transaction, such as illustrated in FIG. **4**A.

The deal generation system **446** refers to the computing devices involved in generating a deal, including an issuer computer device and a plurality of banking devices (collectively known as "syndicate"), and is further described in detail in FIG. **4**C. The deal generation system **446** (sell side) and the buy-side system **438** may comprise multiple computers operated by multiple issuers and managers; these computers are not all shown for clarity. The computing devices associated with the deal generation system **446** and the buy-side system **438** may execute predetermined program commands for interfacing with the analytic servers **432** for participating in generating and marketing a deal and/or the security offering.

Investor computer device **444**, buy-side API **440**, and investor computer device **442** may be any electronic device suitable for displaying graphical user interfaces for a user operating a computing device on the buy-side **438** (e.g., investor placing an order), such as a workstation, desktop computer, laptop computer, smart phone, tablet computer, smart watch, or the like. The deal generation system **446** and the buy-side **438** may access the analytic servers **432** over the communication network **424** such as, for example, the Internet to access the graphical user interfaces provided by the analytic servers **432**. It should be noted, however, that various other networks could be used including, but not limited to, direct-dial closed networks, private local area networks (LANs), wide area networks (WAN), etc.

As described above, the deal generation system **446** may contain multiple computing systems itself. For example, the deal generation system **446** may contain an issuer computer device and multiple banking computer devices. The computer devices within the deal generation system **446** may use various graphical user interfaces provided by the analytic servers **432** to collaboratively generate a deal.

Once the deal is completed (e.g., finalized and agreed upon by all collaborating parties of the syndicate **220** as described below), the deal generation system **446** may send the deal to be purchased by the buy-side system **438**. The buy-side system **438** may transmit various offers from buyers, which may then be transmitted by the analytic servers **432** to the IssueNet network **448**. More specifically, the analytics servers **432** may display various graphical user interfaces on any of the computing devices described herein that allows each respective user to monitor various stages of the deals.

In some other embodiments, the user operating the investor computer device **442** may use an API **440** to automatically access the deal (e.g., the deal dataset including deal attributes). For example, the user operating the investor computer device **442** may use the API **440** to automatically transmit pertinent deal data to another software program installed and executing on the investor computer device **442**. In this way, even though the user operating the investor computer device **442** is not directly in contact with the analytics server **432** (e.g., may not permit the analytic servers **432** to display GUIs on the investor computer device **442**), the deal dataset may be used to populate a third-party investment software.

The analytic servers **432** may control and monitor the entire process and once an offer has been accepted, the analytic servers **432** may send the deal and the offer (e.g., transmit data representing the deal and the offer) to the IssueNet network for processing.

During the security syndicate offering, the deal generation system **446** offers one or more security syndicates for sale to raise capital. This offer can be presented in various forms, including an electronic deal communicated to the analytic servers **432**. The electronic message would contain all the necessary information for processing the security offering or deals and subsequently selling the security offerings or deals (e.g., financial instruments). The information may be stored on the processing subsystems **436** where it can be restrictively accessed by the investor computer devices **444** and/or **442**. The webserver **434** can control the restrictive access, for example, by means of a username and password that uniquely identifies the computing devices within the buy-side system **438**. Thus, it is possible for the transaction monitoring computer system **401** to support multiple sell-side computer systems and multiple deal generation systems simultaneously interacting with the analytic servers **432**. Each computer device shown in FIG. **4**B would be restricted to viewing security offerings or deals of which they are a part (or have legal access rights to), thus addressing privacy and/or security concerns in addition to complying with various syndicate offering regulations.

During the security syndicate offering, all data relating to the deal are transmitted (by the analytic server **432**) to the buy side system **438**. This information is subsequently (directly or indirectly) transmitted to the investor computer devices **444** and/or **442**.

The deal generation system **446** may generate a security offering (e.g., deal or financial instrument) and then communicate the offering with the analytic servers **432** in order to monitor transactions being conducted during their deal offerings. As previously stated, the investor computer devices **444** and/or **442** transmit data corresponding to such transactions to the analytic servers **432**. Accordingly, this information is accessible by the deal generation system **446** in order to monitor the deal offering. The data corresponding to the transactions is preferably displayed on any of the computing systems associated with the deal generation system **446** and may be automatically updated in real time. For example, every time the buy-side system **438** transmits information to the analytic servers **432** regarding a transaction or an offer/bid, that data could be automatically transmitted to the deal generation system **446** to update the records. Alternatively, the deal generation system **446** can manually select to update information regarding the deal offering. For example, a computer associated with the deal generation system **446** may transmit a message to the analytic servers **432** and access the most recently uploaded data using variety of the graphical user interfaces provided by the analytic servers **432**.

According to one embodiment, the deal generation system **446** can be configured to correlate data received from the analytic servers **432** and generate reports that represent the progress of transactions during the deal offering. The reports can be in various forms including, for example, tables, graphs, etc. In addition, the computing devices within the deal generation system **446** can be optionally configured to process the data received from the analytic servers **432** and identify certain trends such as a reduction in the rate of orders being submitted, an increase in the rate of orders being submitted, a change in the relative distribution of orders being received, etc. The trends can be generally considered as indicators of the progress of the deal offering. Based on these identified trends, the deal generation system **446** can optionally contact any computer devices within the buy-side system **438** in order to incorporate changes designed to achieve predetermined results.

For example, if an identified trend shows that the number of orders being received, or the rate at which orders are being received is going down, the deal generation system **446** may wish to contact the any of the computing devices within the buy-side system **438** to discuss a change in pricing that would make the deal more attractive to buyers and/or investors. For example, if the financial instruments offered by the deal are municipal bonds, the deal generation system **446** might suggest a reduction in the interest rate and/or a change in the maturity structure of the bonds. In essence, the deal generation system **446** will attempt to identify negative trends (using the graphical user interfaces described below) in the sale of the security syndicates, and take appropriate steps to correct those trends. Similarly, if the deal generation system **446** determines the rate of sale of the security syndicates to be too high, the deal generation system **446** may contact investors (e.g., computing devices within the buy-side system **438**) and, for example, increase the interest rate of the bonds.

In operation, the webserver **434** may be in communication with all the computing entities described herein in order to provide the latest and most accurate transaction and deal information to all the parties. The webserver **434** may query the latest data from the processing subsystems **436** and generate a variety of graphical user interfaces displayed on computing devices operated by the parties described herein. For example, the webserver **434** may display the latest deal modifications, request for approvals from the issuing computing devices in order to create a collaborative deal.

The processing subsystems **436** may collect and analyze transaction prices from the deal generation system **446** and display different graphical user interfaces on computing devices operated by the investors, syndicate members, and sales members. Upon receiving any order indication data (e.g., a bid, order, counter offer, and the like) the processing subsystems **436** may then modify the transaction data and the web server **434** may display a new graphical user interface (or update the same GUI in real time) using the

updated transaction data and display said data. The web-server **434** may continuously update the graphical user interfaces displayed on computing devices operated by different parties. As a result, all parties described herein may have access to the latest and most accurate transaction data displayed on a specifically designed easy-to-digest graphical user interface.

The processing subsystems **436** are also configured to collect and store all transaction data in a local or remote database. The processing subsystems **436** may monitor all deal or transaction modifications (price modifications by the issuer computing system (e.g., deal generation system **446**), bids received from the buy-side system **438**, and communications between all the parties described herein). The processing subsystems **436** may generate a deal dataset for each deal and store the above-mentioned data as metadata (or store them in a plurality of data records) within the deal dataset. The processing subsystems **436** may also store additional data, such as an economic calendar including market conditions, price tickers, geographic location of the bidders and buyers, and the like within the above-mentioned dataset. In this way, a party with access to a deal dataset (e.g., a deal snapshot) is able to review a thorough history of the deal from the beginning (e.g., when the issuer indicates the initial price) to the end.

FIG. **4**C illustrates components of a deal generation system **446**, according to an embodiment. The issuer computer system (e.g., deal generation system **446**) comprises a database **450**, banking computer devices **452***a-c* (collectively banking devices **452** or syndicate members), and an issuer computer device **454**. The issuer computer device **240**, the banking devices **452**, and the database **450** may communicate with each other via the communication network **424**, such as the Internet or a private network associated with each of the above-mentioned computer devices as described in FIG. **4**B. The above-mentioned computer devices are also in communication with the analytic servers **432**.

In operation, the issuer computer device **454** may request the analytic servers **432** to generate a graphical user interface, receive input (e.g., data associated with the deal) and derive various forms of analytical information from the data records of the database **230** or stored in the analytic server **432** in order to generate a deal and transmit the deal to the banking devices **452***a-c*, collaboratively generate and finalize the deal, and then transmit the approved deal to the various computing devices associated with the buy-side system **438**.

The database **450** may store data records that are associated with interactions between different selling and buying parties, where the data records each contain at least one field identifying which party account is associated with a particular interaction. The database **450** may also record information associated with other issuers, buyers, and investors such as sales volume, sales amount, frequency of interactions, physical location, and the like. The database **450** may also store federal regulations, and other pertinent authoritative legal information relative to the market. The database **450** may be hosted on any number of devices comprising a non-transitory machine-readable storage medium capable of storing data records received from the analytic servers **432**, and in some cases, the banking devices **452** or the issuer computer device **454**. The database **450** may further comprise a processor capable of executing various queries and data record management processes, according to instructions from the analytic servers **432**.

One having skill in the art would appreciate that the database **450** may be hosted on a distinct device that is in networked-communication with the analytic servers **432**. Even though FIG. **4**C refers to the database **450** as a local database associated with the issuer computer system (e.g., deal generation system **446**), the database **450** may also be functionally the same as the processing subsystems **436**. For example, instead of locally saving the data onto the database **450**, in some embodiments, the data may be stored onto the processing subsystems **436**. In some other embodiments, the database **450** may periodically update and transmit data to the processing subsystems **436**. In this way, the analytic servers **432** may have access to the latest and most updated information.

The analytic servers **432** may perform various analytics on data records stored in the database **450** or received from the banking devices **452** or issuer computer device **454** and transmit the results to any of the above-mentioned devices/parties within system **401**. The analytic servers **432** may also generate multiple graphical user interfaces configured to receive data from the issuer computer device **410**, generate a deal, display the deal in a collaborative platform to one or more parties (e.g., issuer computer device **454**, banking devices **452**, and/or any other party allowed to access the deal), permit collaboration among the parties, and finalize the deal.

In operation, banking devices **452** may access a web-based service or an application hosted by the analytic servers **432**, from which users (e.g., users operating each banking device) may provide various types of data relevant to deals and/or modify deal attributes that may be stored in a local database (e.g., database **450**) or the processing subsystems **436**. Banking devices **452** may be any device comprising a processor capable of performing the various tasks and processes described herein. Non-limiting examples of banking devices **452** may include a server, desktop, laptop, tablet, and the like. Banking devices **452** comprise any number of computer-networking components (e.g., network interface card) that facilitate inter-device communications via the communication network **424**.

The issuer computer device **454** may access a web-based service or application hosted by the analytic servers **432**, from which users may provide various types of data relevant to deals, modify details regarding the deals, and/or select deals to purchase that may be stored in the database **450** or the processing subsystems **436**. The issuer computer device **454** may be any device comprising a processor capable of performing the various tasks and processes described herein. Non-limiting examples of the issuer computer device **454** may include a server, desktop, laptop, tablet, and the like. The issuer computer devices **454** comprise any number of computer-networking components (e.g., network interface card) that facilitate inter-device communications via the communication network **424**.

In operations, graphical user interfaces described herein may be displayed on any of the above-described computing devices. The graphical user interfaces may be customized for each particular user based on each user's role and viewing permissions.

Referring to FIG. **5**, a flowchart is illustrated for displaying steps performed when monitoring the flow of transactions during a security syndicate offering. During the security syndicate offering, the senior manager computer system **418** principally interacts with the security syndicate transaction computer system **410** and the syndicate members **426**. However, the issuer computer system **414** also has an ability to monitor the transactions being conducted, as will be

described further herein below. While the below described steps are in a particular sequence, it is possible to alter the sequence of steps and/or perform some or many of the steps in parallel. Further, the specific steps/systems described herein are described in connection with an issuer syndicate financial transaction. However, embodiments may easily be adapted to a variety of financial transactions, as necessary. At step **510**, the issuer computer system **414** accesses the security syndicate transaction computer system **410**. As previously stated, this step can be performed using the issuer's computer **416** to contact the security syndicate transaction system subsystems via the communication network **424**. Upon contacting the security syndicate transaction computer system **410**, the issuer computer system **414** can optionally be requested to supply a username and password that uniquely identifies the issuer computer system **414** and restricts the information accessible by the user.

At step **512**, the current security syndicate offerings available from the issuer computer system **414** are displayed on the issuer's computer **416**. Depending on the particular issuer computer system **414**, there may be one or more security syndicate offerings available at any given time. According to one embodiment, the security syndicate offerings can be presented in the form of a calendar menu displaying one or more security syndicate offerings available from the issuer system **114**. The calendar menu can also display general information regarding each security syndicate offering, such as the value, closing date, and a brief description. At step **514**, the issuer computer system **414** selects a particular security syndicate offering to monitor. Depending on the particular computer software being used by the issuer computer system **414**, the security syndicate offering can be selected, for example, using a graphical input/selection device such as a mouse or stylus, or by entering a predetermined keystroke or command using the keyboard.

At step **516**, the issuer's computer **416** displays deal information corresponding to the selected security syndicate offering. The deal information can include, for example, the closing date, financial structure, rating, etc. for the selected deal. At step **518**, it is determined whether an expiration time has been reached. The expiration time corresponds to the time at which the security syndicates are no longer available for sale. If the expiration time has been reached, then the selected security syndicate offering is identified as being closed (step **520**), and control passes to block **3**. If the expiration time has not been reached, then the deal information on the issuer's computer **416** (the graphical user interface displayed on the issuer's computer **416**) is updated.

At step **524**, data received for the deal information is correlated. Correlation of the received data can vary depending on the particular security syndicate offering and issuer computer system **414**. In essence, the issuer computer system **414** is free to dictate the type of information that they seek while monitoring transactions. Thus, one issuer may desire that the correlated data quickly provide an indication of the number of security syndicates being sold. Another issuer may require that the correlated data quickly provide an indication of the rate at which the security syndicates are being sold. Yet still another issuer may require that the correlated data quickly identify the geographic distribution for sales of the security syndicates.

At step **526**, the issuer computer system **414** decides if a report should be generated. If no report is desired at the time, then control passes to block **2**. If, however, the issuer computer system **414** would like to prepare a report, then control passes to step **528** where the report is generated. The reports can also vary depending on the particular issuer's requirements, and are primarily intended to present information that will assist the issuer computer system **414** in following and understanding the progress of transactions during the security syndicate offering. For example, one embodiment provides for reports that present a graphical analysis of the correlated data. Thus, the report can optionally correspond to the manner in which the data is correlated. At this point, control can return to step **518** where it is again determined if the expiration time has been reached.

According to one embodiment, after generating the reports at step **528**, control passes to step **530**. At step **530**, the issuer computer system **414** and/or issuer's computer **416** identifies trends in the report generated. As previously indicated, the trends can be considered as indicators of the progress of the security syndicate offering. Depending on the particular trend identified, the issuer computer system **414** may optionally contact the senior manager computer system **418** at step **532**. At step **534**, the senior manager computer system **418** can adjust various values in the security syndicate offering to make the security syndicates either more attractive or less attractive to potential buyers. These adjustments in values are made based, at least in part, on information and/or permission received from the issuer computer system **414**. After the values have been adjusted, control returns to step **518**. It should be noted, however, that the senior manager might independently adjust these values without contacting the issuer, depending on the particular security syndicate offering and the relationship with the issuer.

Referring to FIG. **6**, if the issuer computer system **414** did not request a report at step **526**, then control would now pass to step **536** (from block **2**). At step **536**, it is determined whether a second expiration time has been reached. The second expiration time corresponds generally to a time frame during which orders for the security syndicates will be accepted. This often referred to as the order period. If the second expiration time has not been reached, then control passes to block **1**. Block **1** returns control to step **522** and the process continues as previously discussed.

If the second expiration time has been reached, then at step **538**, it is determined whether the current transaction value is greater than the security syndicate offering value. The transaction value corresponds to the monetary value of the security syndicates that have successfully been sold. The security syndicate offering value corresponds to the total monetary value of the security syndicate offering. Referring additionally to FIG. **5**, if it was determined at step **518** that the expiration time had been reached, then the deal would be closed and control would have passed to block **3**. As shown in FIG. **6**, block **3** directs control to step **538**. If the transaction value is not greater than the security syndicate offering value, then control passes to step **540**.

At step **540**, information is transmitted to the issuer's computer **416** so that the issuer computer system **414** may view a display of residual deal information. The residual deal information will generally correspond to security syndicates, or the amount of the security syndicates, that have not been sold after the security syndicate offering is closed. Control then passes to step **542**. In addition, if the transaction value was determined to be greater than the security syndicate offering value, then control would also have passed to step **542**. At step **542**, information is transmitted to the issuer's computer **416** so that additional deal information can be displayed to the issuer computer system **414**. The additional deal information corresponds to allotment information for the sale of the security syndicates. The additional

deal information can include, for example, the names of the financial institutions that are purchasing the security syndicates and the value of the purchases.

At step **544**, it is determined if a third expiration time has been reached. The third expiration time generally corresponds to the end of an allotment period for allotting the security syndicates to various institutions and/or investors. If the third expiration time has been reached, then the security syndicate offering is closed (step **546**). If the third expiration time has not been reached, then control passes to step **548**. At step **548**, data is transmitted to the issuer's computer **416** to update the additional deal information. At step **550**, the issuer computer system **414** and/or issuer's computer **416** correlate the additional deal information. At step **552**, the issuer computer system **414** determines if a report should be generated. If a report should be generated, then control passes to step **554**. Otherwise, if a report will not be generated, then control passes to step **544** where it is again determined if the third expiration time has been reached. Once the report has been generated at step **554**, the process can either end, or optionally return to step **544**.

As previously discussed, data can be transmitted to the issuer's computer **416** for purposes of updating the deal information and the additional deal information, either automatically or manually. For example, automatic updating would occur by the security syndicate transaction computer system **410** transmitting the updated data to the issuer's computer **416** every time the senior manager computer system **418** transmits transaction data to the security syndicate transaction computer system **410**. Alternatively, the issuer computer system **414** can select a refresh button on the computer display to manually request transmission of updated data from the security syndicate transaction computer system **410**.

The system described herein (sometimes referred to as "book running system) can be used to control the flow of information between syndicate members **426** during security syndicate offering. The book running system provides the senior manager computer system **418** with at least some of the tools necessary to configure, manage, and process the security syndicate offering. Thus, the book running system would provide the senior manager computer system **418** with an ability to collect and enter data pertaining to the syndicate group and the security syndicate offering. Once the data has entered, the embodiments may be used by the issuer computer system **414** to monitor the flow of transactions. In some embodiments, a user such as an issuer may be connected via their mobile phone or a computer to the systems described in FIGS. **2-4**, which displays for them the active issuance of bonds and other financial instruments at different maturity bonds.

FIG. **7** illustrates a graphical user interface displaying offering data, according to an embodiment. The illustrated graphical user interface (GUI **700**) may be presented on an issuer's electronic device such as a computer, tablet computer, smart phone, or the like. The GUI **700** may include a recent orders tab that illustrates the recently ordered maturity bonds (not shown), a summary tab that illustrates all the maturity bonds (not shown), a top managers and accounts tab that illustrates the top managers associated with a subset of maturity bonds (interactive hyperlink **720**), and an overview section (**710**).

The overview section **710** (illustrated in GUI **700**) may include the illustrated vertical bar charts with a line illustrated within the chart. Each vertical bar (for example, vertical bar **740**) may represent a maturity such as a maturity for a specific year and month. The height of the bar may represent a dollar amount for that maturity. For example, the vertical bar **740** represents the total dollar amount for a particular maturity for December 2035. The line in the bar (e.g., line **750**) represents the total number of dollars that are available in the par amount for the maturity. Therefore, the area filling the bar chart above the line indicates the amount that a maturity is oversubscribed. The number **760** (illustrated on the top of each vertical bar) may indicate how much each maturity is oversubscribed. GUI **700** is configured to illustrate any transaction data regarding any security syndicate and is not limited to maturity bonds.

"Oversubscribed" is a term used for situations in which a new security issue, such as a stock or bond, is underpriced or in great demand by investors. When a new security issue is oversubscribed, the parties offering the security (e.g., issuers) can adjust the price or offer more securities to reflect the higher-than-anticipated demand. For example, the number **760** indicates 2.0×, and number **761** indicates 1.7×; the number **760** indicates that the December 2035 maturity bond is oversubscribed by two times and the number **761** indicates that December 2042 maturity bond is overs subscribed by a factor of 1.7 times. Typically, an oversubscribed maturity bond offering indicates that the bond is in high demand, and therefore, a price increase by the issuer may be justified. A negative number (e.g., undersubscribed number of −1.0) indicates that the demand is less than the offered amount; therefore, a price decrease may be needed. The GUI **700** allows the parties involved in bond trading (particularly the issuers) to easily and quickly determine whether to increase or decrease the price for a particular bond with specific maturity dates.

The GUI **700** also provides different lens options (illustrated at the top of the GUI **700** as different toggles), which when clicked by the user, may display or modify the GUI **700** to display a specific category of maturity bonds. For example, the user may click on retail (interactive hyperlink **730**) or managers (interactive hyperlink **720**). When a user clicks on retail (interactive hyperlink **730**), several columns may be grouped into one and their accumulated data reflected based on a specific retailer. Selecting manager (interactive hyperlink **720**) may allow a user to see all data sorted based on their respective sales manager (e.g., what maturity bonds are being sold and how they are performing under that manager). Clicking on manager (interactive hyperlink **720**) may also allow the user to further select a manager and view all maturity bonds related to that manager (e.g., all maturity bonds under the particular manager's management or bids approved by the manager). Utilizing this feature, users can quickly gage each manager's performance. Similarly, clicking on retail (interactive hyperlink **730**) allows the user to narrow the bonds displayed by a particular retailer and gage that particular retailer's performance.

GUI component **770** may include recent orders that were placed or processed. GUI component **770** may be dynamically updated in real time (e.g., as the orders are received and/or processed). Therefore, the most recent order may be presented on the top or the bottom of the recent orders list. For example, order **771** indicates that Fund A has placed an order for 3,535 orders of a December 2022 bond. Order **772** illustrates an order for 3,375 orders for a December 2021 bond by the same Fund A. Clicking the option "View All" (interactive hyperlink **773**) presents a pop up of all the orders. Similarly, "View All" may take the user to another screen with a complete list of all the orders, which may be customized, sorted, and filtered by a variety of factors, such as amount, ordering entity, time of order, and the like. The

user may utilize the GUI component **770** to track individual orders as they are received (e.g., received by the security syndicate transaction computer system). The users are also able to sort the orders by geographic location (e.g., zip code associated with the orders). For example, the GUI **700** may display a map and indicate all the orders received in a user-friendly manner (e.g., heat map or color-coded). The webserver may be dynamically display and continuously update the GUI component **770** in order to illustrate the latest order data. Utilizing the data displayed in the GUI component **770**, users may quickly be able to see order size, maturity, geographic data, investor name and the manager that has approved the order another example of displaying orders is described in FIG. **18**.

FIG. **16** illustrates a graphical user interface displaying syndicate offering data and geographic analysis of the orders, according to an embodiment. As described above, in addition to displaying the maturity bond data, the webserver **412** may also display geographical and order analysis. For example, GUI **1600** illustrates that, in some embodiments, the webserver **412** may display the maturity bond data (e.g., GUI component **1610**) as described in FIG. **7**, latest order data (GUI component **1620**) as described in FIG. **7**, geographical analysis (e.g., GUI component **1630**), and granular order data (e.g., GUI component **1640**). The GUI component **1630** may display a heat map of order locations (e.g., location from which the orders have been received). A heat map is a representation of data in the form of a map or diagram in which data values are represented as colors. For example, as illustrated by the GUI component **1630**, when more orders are received from a geographic location, that geographic location is displayed using darker colors. The location analyzed may be limited to a specific state (e.g., as illustrated by the GUI component **1630**) or illustrate a nationwide study of all orders received.

The GUI component **1640** is a pie chart that represents a granular analysis of all the orders received. A pie chart is a type of graph in which a circle is divided into sectors that each represents a proportion of the whole. For example, the pie chart illustrated in GUI component **1640** illustrates different sectors that represent different type of investors who have placed orders for maturity bonds illustrated in GUI component **1610**. The colors used in the pie chart may match the color used to illustrate the orders in GUI component **1610**. In some embodiments, a user may export the GUI **1600** (e.g., save and transmit all the data) to another electronic device. For example, an issuer may save a snapshot of the GUI **1600** (e.g., image or a file comprising metadata that represents all the information represented in GUI **1600**). The snapshot file may be shared with other computing devices and transmitted over a network (e.g., Internet).

The summary tab (GUI component **780**) may include a countdown clock, the total orders that have been received, percentage indicators for short, mid, and long-term bonds, and a total order fill indicator. Another illustration of the summary tab is presented in FIG. **8**. In GUI component **780**, an indicator of the total orders (in dollars or any other specified currency) is displayed. In the example illustrated in FIG. **8**, for example, $232,345 of orders have been placed (GUI component **781**) with an oversubscription factor of % 140 or 1.4× (GUI component **782**) when four hours, forty-three minutes and twenty seconds remain before the end of issuance (GUI component **783**). Further, the GUI component **784** presents orders that are filled (e.g., processed). In this example, the GUI component **780** displays $162,140 (**784**) with a remaining balance of $7,205 (GUI component **785**) and a fill rate indicator **786** that states 96% (e.g., 96% of the order have been processed/filled). The short, mid and long maturity bonds may be categorized and indexed showing what percentage of the orders are in each category (e.g., fill rate indicators **787-789**).

As described herein the terms short, mid, and long refer to a relative time for which the maturity bond matures. For example, if a maturity bond matures in five years, the maturity bond may be considered a short because a client may have selected all bonds maturing within the next ten years to be considered "short." These time thresholds may be predetermined or received from the client (e.g., issuer's computer described in FIG. **4**A). Displaying the short, mid, and long fill indicators can be useful during the day of a transaction or the day of issuance as issuers may proactively and quickly see which groups are low or high where live pricing may be altered. For example, if short-term maturity bonds (e.g., 0-10 years) are 20% and long term are 80%, an issuer may lower prices of short term and/or raise prices of long term in order to balance orders. Fill rate indicators (e.g., fill rate indicators **787-789**) may be updated in real time to accurately and quickly indicate above-mentioned fill rates and indicate the overall deal progress across the entire curve or by sections (e.g., they may be customized and filtered by the user to show only a desired cross sections of orders).

Referring back to FIG. **7**, GUI **700** may also include a GUI component **790**. GUI component **790** may display the top managers and accounts and may track aggregate investor and syndicate member participation on a particular deal. For example, GUI component **790** may display the largest participant on top or arranged vertically by size (or any other method customized by the user). Another illustration of the top managers and top accounts tab is presented in FIG. **9**. In GUI component **790**, users may generate reports to get a thorough breakdown of orders by either syndicate member or investors across priority types, syndicate member types or investor types. As shown in FIG. **9**, the top accounts of Asset Manager A, Asset Manager B, XYZ Capital, etc., may be presented sequentially. For example, as illustrated, Asset Manager A is listed as having 53,000 orders and Asset Manager B as 37,500 orders. Similarly, number of maturity bonds may be displayed and used to organize the display order. In this way, issuers are able to see who is ordering the most and by how much.

Further, clicking on the names or rows of each asset manager displayed in GUI component **790** may bring a pop up GUI component or display of the account profile for that manager or account. The profile may include the holdings data for that manager/account. For example, the types of investments the manager has under management may be displayed. Similarly, contact information may be displayed including telephone number, work address, email address, geographic location, and URL. Finally, the type of money being managed may be displayed such as bond fund, hedge fund, etc. Clicking on the manager's name may include how their portfolios are broken down such as how many bond funds, how many mutual funds and how much managed account money is being received. The insurance type may be displayed with options such as whether new property or casualty are part of the assets in the account.

Referring now to FIG. **15**, an example of a pop up GUI component displaying manager profiles is illustrated. By clicking on XYZ capital displayed on GUI component **790**, pop up GUI component **1510** may be displayed. Pop up GUI component **1500** may comprise the name of the XYZ Capital, currency in which XYZ Capital trades, and a location associated with the XYZ Capital in GUI component **1510**. GUI component **1520** may display total assets and an

overview of the XYZ Capital's financial portfolio. Furthermore, GUI component **1530** may display an order summary of the XYZ Capital (e.g., amount and number of orders and other pertinent order information). GUI **700** may display the pop up GUI component **1500** in a separate page (displayed on a separate graphical user interface or a webpage) or display the pop up **1500** as a top layer displaying alongside the GUI **700**.

Referring back to FIG. **7**, GUI **700** may also include a GUI component **791** that is configured to display market data as customized by the user, such as a price ticker, S&P 500, Dow, Oil, Gold, or Muni ticker or index, current market news (e.g., financial news), and the like. For example, the user may customize the GUI component **791** to display a stock price ticker. A stock ticker is a report of the price for certain securities, updated continuously throughout the trading session by the various stock exchanges. A "tick" is any change in price, whether that movement is up or down. In some embodiments (as described in FIG. **14**) by selecting GUI component **791**, GUI **700** may display a pop up comprising additional and relevant economic data.

FIG. **14** illustrates a graphical user interface displaying syndicate offering data and additional economic data, according to an embodiment. In some embodiments, the webserver **412** may display economic data in addition to the maturity bond data. For example, upon a user engaging with a selectable GUI component (such as GUI component **791** described above), the webserver **412** may display a pop up window (such as pop up **1410**) or a sliding GUI component comprising customizable economic data. Pop up **1410** may include S&P 500, Dow, Oil, Gold, or Muni ticker, United States Treasury Yield Rates (UST), Municipal Market Data (MMD) timelines, and an economic calendar (e.g., a calendar used by traders for tracking the occurrence of market-moving events). The user may customize the economic data viewed. For example, the user may customize the pop up **1410** to display S&P 500 price ticker instead of a gold price quotes. The user may also customize the color, font, and display location of the pop up **1410** or any economic data displayed.

FIG. **10** illustrates another embodiment of the graphical user interface displayed for different parties described in FIGS. **4**A-C. Some embodiments may include order control where a user may select various lenses to view an order book (e.g., portfolio of all the security syndicates) across tranches, including a general overview by priority type, retail categories and manager type. A user may click on any maturity bond displayed on GUI **1000** (e.g., selectable bar **1010**) to retrieve further detail of the tranche and its orders. This feature is further described below. In some embodiments, a user may search for or select from a dropdown menu (e.g., menu **1020**) any investor or syndicate member and view all their orders. For example, when the user clicks on the menu **1020**, GUI **1000** may generate and display the pop up **1021** that comprises different accounts and different managers). Once the user clicks on any of the managers or accounts, the GUI **1000** may display a new interface that only displays order information filtered by the selected manager or account. Similarly, the user may directly search for a particular manager or account using the search engine **1030**. A user may also view maturity bonds by series, coupon, or any other attributes that the user deems fit and combine into a single maturity at the click of a button.

FIG. **11** illustrates another embodiment of the graphical user interface displayed for different parties described in FIGS. **4**A-C. When a user clicks one of the bar charts or maturity bond displayed on the GUI **1100** (e.g., selectable bar chart **1110**), GUI **1100** may display more granular data regarding that bond or order. In the example illustrated in FIG. **11**, the user has clicked the bar chart **1110**. In response, GUI **1100** populates and displays GUI component **1120** in the portion of the user interface below the selectable bar chart **1110** (or any other portion of the GUI **1100** as customized by the user). GUI component **1120** may be a pop up window or as a separate portion of the same window, which displays data relevant to selectable bar chart **1110**. In the example illustrated in FIG. **11**, the information displayed in GUI component **1120** is the series, the number of orders, the coupon rate, insurance information, the yield/price of the maturity, the amount of subscription, and the par value. A skilled artisan will appreciate that the information displayed in the pop up may be customized by the user or may be automatically generated based on the user's preferences or user's role. Further, the bar chart is zoomed in (e.g., is displayed using a larger font and a scale) with the dollar values that are easier to see for the par value and current subscription. GUI **1100** may also include order information for the maturity represented by selectable bar chart **1110**. For example, GUI component **1130** lists order #2 for Manager Bank A and Account Asset Manager A to be at $40,000 (million). Similarly, order #13 at the bottom of the list is displayed as $1,000 (million) for Account Company B with Bank A again as the Manager. As described above, a user can easily peruse detailed information associated with different maturities. The user may also be able to glance (e.g., during a three to five second test) and see that the December 2019 maturity is two times over, the December 2021 maturity is 4.3 times over and the December 2031 maturity is two times over.

FIG. **12** illustrates multiple graphical user interfaces displaying offering data using a client's customized graphical user interface, according to an embodiment. In some embodiments, the webserver **412** may also have access to one or more databases or pre-stored web-based interfaces, such as webpages, comprising a number of preconfigured sub-interfaces or containers, dynamically populated from the transaction data analyzed. The webpages may be operated by a client (e.g., issuer computer system) and may contain proprietary code, such as HTML or PHP, presenting a variety of private content not known to the webserver **412** (e.g., GUI component **1230**). These webpages may contain additional code for containers, where the container code may be modified to display customized content. In order to preserve the common "look-and-feel" of the client website and in order to create a better user experience, the webserver **412** may access the container code and display any of the graphical user interfaces described above within the client website/webpage.

For example, instead of displaying separate graphical user interfaces on computer devices of an issuer Entity XYZ, the webserver **412** may query container code for the webpage **1200** (operated by the issuer entity XYZ and viewable only to XYZ employees) and populate the sub-interfaces **1210** and **1220** of the webpage **1200** with the appropriate data. The webserver **412** may display any of the above-mentioned graphical user interfaces while the webpage display is configured to maintain the web site's common aesthetic (e.g., other features displayed by the issuer entity XYZ, such as GUI component **1230**). One skilled in the art will appreciate that the issuing company XYZ may be able to customize the font, size, color, coordinates and other attributes of the sub-interfaces **1210** and **1220**.

FIG. **13** illustrates a graphical user interface displaying offering data in a tabular form, according to an embodiment.

In some embodiments, the webserver **412** may provide raw data (maturity bond data presented in tabular form) upon the issuer's request. For example, a selectable GUI component may be presented to the user and, upon the user engaging the selectable GUI component, a graphical user interface (such as GUI **1300**) may display raw data corresponding to the maturity bonds displayed in a tabular form. Row **1310** may display the maturity date, series indicator, coupon percentage amount, and maturity bond amount; break down of different retailers (e.g., NJ retailer, national retailer, and total retailer), overall balance and whether the maturity bond is oversubscribed.

The processing subsystems **422** may also store additional data, such as an economic calendar including market conditions, price tickers, geographic location of the bidders and buyers, and the like within the above-mentioned dataset. In this way, a party with access to a deal dataset (e.g., a deal snapshot) is able to review a thorough history of the deal from the beginning (e.g., when the issuer indicates the initial price) to the end (e.g., when the syndicate offering is terminated and maturities are sold).

As illustrated by FIG. **17**, users may customize the display of maturity bonds using various methods. For example, in GUI **1700**, different maturity bonds are displayed. Each maturity bond (e.g., maturity bond **1711**) displays the maturity date and is color-coded (based on the legend **1720**) to illustrate the orders received from different geographic locations. By customizing the GUI **1700**, the user may only view the orders received from New Jersey and compare the order received from New Jersey with the orders received nationwide. In some embodiments, if a particular maturity bond is oversubscribed (e.g., maturity bond **1711**), different colors representing the orders may exceed the bounds of the maturity bond **1711**. On the other hand, if the maturity bond is undersubscribed (e.g., maturity bond **1712**), the color representing different orders may be shown in proportion to the undersubscription ratio. In other words, maturity bond **1712** is 50% undersubscribed; therefore, the graphical representation of the maturity bond **1712** represent a half-empty bar chart.

FIG. **18** illustrates a GUI component that efficiently displays the orders, according to an embodiment. As described above, different GUI components may display orders. For example, GUI component **770** (described in FIG. **7**) may display recent orders that were placed or processed and may sort the orders based on time received, managers associated with the order, or the amount of the order. In another non-limiting embodiment, GUI component **1800** may dynamically display the orders based on the performance of the associated maturity bond. For example, GUI component **1800** may display that Bank 1 has placed an order for $5000 on maturity bond Fund A. Additionally, a performance indicator **1810** may be displayed that allows the user to quickly gage the performance of Fund A. Performance indicator **1810** may comprise a subscription rate indicator **1820** that graphically illustrates whether Fund A is oversubscribed or under subscribed. The subscription rate indicator may comprise a fill bar that is filled in accordance to a subscription percentage. For example, when a maturity bond is fully subscribed, the subscription rate indicator is shown as filled (e.g., subscription indicator **1830**) and when a maturity bond is half subscribed, the subscription rate indicator is half-filled. Performance indicator **1810** may also illustrate an order process rate for each maturity bond. For example, when 0% of the orders for a maturity bond have been processed, the subscription rate indicator may appear on the left of the performance indicator (e.g., subscription rate indicator **1820** being displayed on the left side of the performance indicator **1810**) and when 100% of the orders for a maturity bond have been processed, the subscription rate indicator may appear on the right side of the performance indicator (e.g., subscription rate indicator **1840** being displayed on the right side of the performance indicator **1850**). One skilled in the art will appreciate that other methods may be used to illustrate the performance of each maturity bond, such as color-coding the performance indicator.

In some configurations, the method and systems described herein can be utilized to display data regarding various aspects of one or more offerings. For instance, the various servers described above may aggregate deal data from various issuers and display aggregated data on a computing device of the buy-side, sell-side, or both. Various parties described herein can utilize such aggregated data to optimize offerings (e.g., select suitable prices, understand supply and demand in the market, and gauge market movements). Non-limiting examples of these market analytics are illustrated in FIGS. **19-21**.

FIG. **19** illustrates a graphical user interface displaying offering data, according to an embodiment. As described above, the GUI **1900** can be displayed on a variety of computers within the computer system illustrated in FIGS. **1-4**C.

GUI **1900** may include two main graphical components (e.g., graphical components **1910** and **1920**). The graphical component **1920** may display various offerings and their attributes. When a user interacts with a particular offering, the GUI **1900** may dynamically update the graphical component **1910** to display detailed data regarding that particular offering. Users may filter/sort the offerings displayed within the graphical component **1920** using various attributes, such as time of offering, geographic location of the offering, issuer attributes, and the like.

The graphical component **1920** may display component **1921** that lists the date and par amounts for various offerings. The component **1922** displays a name of each offering. The component **1923** may display credit rating for each offering. Component **1924** may display tax information (e.g., tax status) of each offering (e.g., issuer of the offering). Component **1925** may then display the type of the offering (e.g., bond or stock) associated with each offering. Component **1926** may display a sector/category associated with each offering. For instance, each offering may be categorized within a sector (e.g., health care, utilities, or transportation).

The graphical component **1920** may also include component **1927** that displays certificates (if any) associated with each offering. Furthermore, component **1929** may display an indication of a lead manager associated with each offering.

Each component representing an attribute of an offering may be an interactive component where a user viewing the GUI **1900** may interact with to view more details. For instance, when a user clicks on (or otherwise interacts with) the offering represented by the component **1940**, the GUI **1900** dynamically updates the graphical component **1910**.

The graphical component **1910** may include the illustrated vertical bar charts. Each vertical bar may correspond to a time frame (e.g., year, month, or any other inputted time frame). Each vertical bar (for example, vertical bar **1911**) may represent a maturity for a tranche (or any other segmentation of an offering) such as a maturity for a specific year and month. As described above, different bond offerings may include multiple tranches maturing at different rates. Therefore, an offering may include multiple bonds

maturing within a predetermined period (a bond due in 2020 and another bond maturing in 2021). The graphical component **1910** may aggregate all the tranches (and their respective amortization rates) within a time frame and may display a vertical bar per time frame. For instance, the graphical component **1910** may display a vertical bar for each year or every five years. In some configurations, users may input/revise the time frame associated with the vertical bars.

The height of each vertical bar may represent a total amount for that maturity. For example, the vertical bar **1911** represents the total dollar amount for the bond/tranche maturing in 2028. Each vertical bar may also include a line, as depicted. The line within each vertical bar may separate each vertical bar into two separate areas where each area represents a different attribute. For instance, areas **1912** and **1913** illustrate whether a deal is competitive or negotiated. These areas may be visually distinguishable using different colors and/or different patterns. The size of each area (e.g., the height) may represent a dollar amount associated with whether the deal is negotiated or competitive.

As depicted, area **1912** represents the amount of the deal (represented by the vertical bar **1911**) that was sold via a negotiated process. In contrast, area **1913** represents the total amount sold via a competitive process.

In some configurations, a competitive sale and a negotiated sale are the two methods by which an underwriter may purchase municipal bonds from an issuer for reoffering to the public. In a competitive sale, bonds are advertised for sale. The advertisement, by way of a notice of sale, includes both the terms of the sale and the terms of the bond issue. Any broker dealer or dealer bank may bid on the bonds at the designated date and time. The bonds are awarded to the bidder offering the lowest interest cost. In a negotiated sale, an underwriter is selected to purchase the bonds. The underwriter, in turn, sells the bonds to its investor customers. The terms of the bonds are tailored to meet the demands of the underwriter's investor clients, as well as the needs of the issuer. Negotiated sales may also involve a process known as a presale in which underwriters seek customer indications of interest in the issue before establishing final bond pricing.

GUI **1900** allows users to view maturity details while simultaneously gauging a proportion (and amount) of negotiated sale vs. competitive sale. Therefore, the GUI **1900** displays multiple market fundamentals and market analytics in a graphical user interface that is easy to understand. Market fundamentals may represent changes in credit and/or changes in risk appetite in the market. These factors may be the driving factor in price fluctuations. For instance, when market fundamentals are perceived to be "good," the equity markets may experience an increased rate of activity. As more inventors/users purchase more interests (e.g., more bonds), interest rates may also increase.

Market technical may also affect the markets. Therefore, users/inventors may use the detailed data displayed within the GUI **1900** for making informed investment decisions. Market technical may refer to certain fundamental economic indicators, such as supply and demand. These powerful conditions may also affect prices for any commodity, such as bond offerings. The vertical bars displayed in the GUI **1900** provide a breakdown of supply (of bonds/tranches) throughout the supply curve. Different type of buyers may be more interested in tranches maturing at different rates. For instance, insurance companies may desire to buy around the 20-year maturity, many big mutual funds may purchase bonds maturing in 30 years, or retail buyers may purchase bonds with maturity dates within 10 years. Therefore, users can use the GUI **1900** to easily view how various bonds are offered (e.g., supplied) and make informed decisions accordingly.

The GUI **1900** displays various indicators that allow users to understanding details (e.g., the "break up") of the supply of multiple offering. For instance, a user can easily identify spikes in supply and whether a particular year has more maturing bonds than others years do. Understanding details of the supply curve may be useful when submitting bids to purchase bonds in the market. Simply put, the detailed data displayed within the GUI **1900** may convey how supply/demand and other detailed data associated with the sale of various bonds may affect the market and the interest rates in short and long term.

The GUI **1900** may also aggregate the vertical bars displayed within the graphical component and further display an indicator illustrating a maturity progression for each offering. For instance, component **1928** (displayed within the graphical component **1920**) may display indicator **1930** that illustrates an aggregated maturity rate of its corresponding offering. For instance, indicator **1930** illustrates that "New York City transactional finance authority" offering includes bonds that mature later than other offerings (e.g., indicator **1931**). Using these indicators displayed within the component **1928**, users may quickly compare maturities for different offerings. For instance, a user can easily/quickly determine that the "Evergreen school district" offering has tranches that mature substantially more rapidly than the "Cucomonga" offering.

Specifically, the vertical height and the horizontal placement of each bar within the indicator **1930** may correspond to an amount and maturity time for each tranche within its respective offering. In some configurations, the indicator **1930** may resemble the vertical bars displayed within the graphical component **1910**.

As described above, user may click on any attribute of an offering where the GUI **1900** dynamically modifies the graphical component **1910** accordingly. For instance, a user may use the indicators displayed within the component **1928** to quickly compare offering maturities and gauge amortization rapidity. However, users may click on particular indicators and view more detailed maturity bar charts, as illustrated in the graphical component **1910**. In some embodiments, a user may aggregate multiple offerings and the graphical component **1910** may display charts that represent data associated with more than one offering.

As described above, users may customize the GUI **1900**. For instance, users may sort, rank, and filter the offerings based on any of the above-described attributes. For instance, a user may filter/rank the offerings based on credit rating, tax status, or sectors. In some configurations, users may filter or sort offerings based on the "structure" components (component **1928**). For instance, a user may sort the offerings based on when the majority of each offering's tranches mature.

In some configurations, the graphical user interfaces described herein can also display amortization charts without displaying any data associated with the bidding received and/or how the market has reacted to any particular offerings. FIG. **20** illustrates a graphical user interface displaying offering data, according to an embodiment. As described above, the GUI **1900** can be displayed on a variety of computers within the computer system illustrated in FIGS. **1-4**C.

In some configurations, the server generating and maintaining the GUIs described herein do not (e.g., are prevented) display sales data for one or more users. For instance, GUI **20000** displays a particular offering and its

tranche amortization (e.g., maturity). The size and/or height of each vertical bar may correspond to a total amount of offering. As depicted, the bars may be organized monthly (or any other predetermined time frame). Furthermore, unlike GUI **1900**, the vertical bars may only focus on the offering and may not include any data associated with how various tranches have been sold. For instance, vertical bar **20100** may only illustrate deal amortization time and the amount offered (in dollars or any other currency).

FIG. **21** illustrates a graphical user interface displaying offering data, according to an embodiment. As described above, the GUI **21000** can be displayed on a variety of computers within the computer system illustrated in FIGS. **1-4**C.

The GUI **21000** displays various pricing analytics related to one or more offerings. As depicted, the GUI **21000** may include graphical component **21100** and **21200**. The graphical component **21200** may display various offerings and their attributes. When a user interacts with a particular offering, the GUI **21000** may dynamically update the graphical component **21100** to display detailed data regarding that particular offering.

The graphical component **21100** may include multiple lines representing different analytical results regarding an offering. Specifically, line **21101** may represent credit spread for different offerings/bonds. Credit spread, as used herein, may refer to the difference in yield between two bonds of similar maturity but different credit quality. For example, if the 10-year Treasury note is trading at a yield of 6% and a 10-year corporate bond is trading at a yield of 8%, the corporate bond is said to offer a 200-basis-point spread over the Treasury. This comparative method may allow users to compare various bond offerings against a benchmark. In some configurations, a widening credit spreads may indicate growing concern about the ability of corporate (and other private) borrowers to service their debt. In contrast, a narrowing credit spreads may indicate improving private creditworthiness. The credit spread may be based on a calculated risk compared to the U.S. Dept. of Treasury, benchmark spreads, or any other third party spreads.

Line **21102** may correspond to a comparison between the offering/bond and the same deal offered in the past. Users may use the line **21102** for comparing deals to the last time (previous time) the same deal was active in the market. Furthermore, users may also use line **21101** in conjunction with line **21102** to evaluate the offering.

In a non-limiting example, graphical component **21100** displays lines **21101** and **21102** for the "New York City Transitional Finance Authority" offering. The user may use the lines **21101** and **21102** to determine whether this offering is a better credit now, and whether the user should accept less credit spread to buy it. Because as a buyer users typically desire more credit spread, they may also desire higher rates (e.g., higher return or higher yield). Users may view the graphical component **21100** and may determine that this offering is not as attractive as the previous time this offering was brought to the market. User may determine that this offering is a riskier investment than the previous time the same offering was introduced to the market. In the depicted non-limiting example, portions of the line **21101** is below the line **21102**. Therefore, a user can readily identify that the issuer is attempting offer some tranches at a lower credit spread (e.g., more aggressively). In other areas (e.g., where line **21101** is above the line **21102**), the issue may be attempting to sell at a wider credit spread (e.g., less aggressively and more conservatively). These comparisons allow users to visually compare various attributes of one or more offerings and make an informed decision.

The GUI **21000** may also include indicators illustrating a trading attribute (e.g., price) of the offering in the market. For instance, when a user interacts with the indicator **21103**, the GUI **21000** may display a price associated with what that particular tranche is being traded in the market.

The graphical component **21200** may display a spreadsheet displaying numerical values represented by the lines within the graphical component **21100**. For instance, the graphical component **21200** may display various offerings and their corresponding attributes, such as maturity date, par amount, balance, pricing, coupons, third-party spreads, spread to UST, tax yield, and other attributes depicted.

In some configurations, users may toggle between any of the GUIs described herein to view different analytical results associated with one or more offerings. For example, a user may first view the offerings and its maturity in GUI **19000**. Then the user may toggle to GUI **21000** to understand credit risk and pricing analytics before submitting an offer associated with a bond offering. Furthermore, these GUIs may be displayed on the buy-side computers, sell-side computers, or both. The GUIs, however, may be customized depending on the viewing party to avoid potential conflicts and maintain anonymity. For instance, a buy-side computer may be unable to view information of a bidding party (e.g., competitor's name and/or amount of the bid).

Embodiments implemented in computer software may be implemented in software, firmware, middleware, microcode, hardware description languages, or any combination thereof. A code segment or machine-executable instructions may represent a procedure, a function, a subprogram, a program, a routine, a subroutine, a module, a software package, a class, or any combination of instructions, data structures, or program statements. A code segment may be coupled to another code segment or a hardware circuit by passing and/or receiving information, data, arguments, parameters, or memory contents. Information, arguments, parameters, data, etc. may be passed, forwarded, or transmitted via any suitable means including memory sharing, message passing, token passing, network transmission, etc.

The actual software code or specialized control hardware used to implement these systems and methods is not limiting of the invention. Thus, the operation and behavior of the systems and methods were described without reference to the specific software code being understood that software and control hardware can be designed to implement the systems and methods based on the description herein.

When implemented in software, the functions may be stored as one or more instructions or code on a non-transitory computer-readable or processor-readable storage medium. The steps of a method or algorithm disclosed herein may be embodied in a processor-executable software module, which may reside on a computer-readable or processor-readable storage medium. A non-transitory computer-readable or processor-readable media includes both computer storage media and tangible storage media that facilitate transfer of a computer program from one place to another. A non-transitory processor-readable storage media may be any available media that may be accessed by a computer. By way of example, and not limitation, such non-transitory processor-readable media may comprise Random Access Memory (RAM), Read Only Memory (ROM), Electrically Erasable Programmable Read-Only Memory (EEPROM), CD-ROM or other optical disk storage, magnetic disk storage or other magnetic storage devices, or any other tangible storage medium that may be used to store desired program code in

the form of instructions or data structures and that may be accessed by a computer or processor. Disk and disc, as used herein, include compact disc (CD), laser disc, optical disc, digital versatile disc (DVD), floppy disk, and Blu-ray disc where disks usually reproduce data magnetically, while discs reproduce data optically with lasers. Combinations of the above should also be included within the scope of computer-readable media. Additionally, the operations of a method or algorithm may reside as one or any combination or set of codes and/or instructions on a non-transitory processor-readable medium and/or computer-readable medium, which may be incorporated into a computer program product.

The preceding description of the disclosed embodiments is provided to enable any person skilled in the art to make or use the present invention. Various modifications to these embodiments will be readily apparent to those skilled in the art, and the generic principles defined herein may be applied to other embodiments without departing from the spirit or scope of the invention. Thus, the present invention is not intended to be limited to the embodiments shown herein but is to be accorded the widest scope consistent with the following claims and the principles and novel features disclosed herein.

While various aspects and embodiments have been disclosed, other aspects and embodiments are contemplated. The various aspects and embodiments disclosed are for purposes of illustration and are not intended to be limiting, with the true scope and spirit being indicated by the following claims.

What is claimed is:

1. A method comprising:

receiving, by a server, a set of orders in relation to an offering of one or more maturity bonds;

displaying, by the server on a graphical user interface, a set of graphical indicators corresponding to the set of orders, wherein, for at least one order for at least one maturity bond, the graphical user interface displays a bar where a height of the bar is proportional to an amount that the at least one maturity bond is under-subscribed relative to a subscription threshold;

receiving, by the server, at least one additional order for the at least one maturity bond; and

dynamically updating, by the server, a horizontal position of the bar to indicate an order process rate for the at least one maturity bond in response to the at least one additional order.

2. The method of claim **1**, wherein a position of the bar corresponds to a value of processing of a corresponding order.

3. The method of claim **2**, wherein the height of the bar corresponds to a vertical height of the bar.

4. The method of claim **1**, wherein the graphical user interface further displays a name of an entity associated with the at least one order.

5. The method of claim **1**, wherein the graphical user interface further displays an order dollar value associated with the at least one order.

6. The method of claim **1**, wherein the graphical user interface is updated in real-time or near real-time.

7. The method of claim **1**, wherein the graphical user interface further displays a number of dollars that are available in a par amount for the at least one maturity bond or the at least one order.

8. The method of claim **1**, wherein the graphical user interface further displays at least one of a total monetary value corresponding the at least one order, a time remaining indicator, or a short fill percentage, mid fill percentage, or long fill percentage.

9. The method of claim **1**, wherein the graphical user interface further displays a manager associated with the at least one order.

10. The method of claim **1**, wherein the set of graphical indicators corresponding to the set of orders based on a time value corresponding to each order.

11. A system comprising:

a computer readable medium comprising non-transitory instructions, that when executed, cause a processor to:

receive a set of orders in relation to an offering of one or more maturity bonds;

display, on a graphical user interface, a set of graphical indicators corresponding to the set of orders, wherein, for at least one order for at least one maturity bond, the graphical user interface displays a bar where a height of the bar is proportional to an amount that the at least one maturity bond is under-subscribed relative to a subscription threshold;

receive at least one additional order for the at least one maturity bond; and

dynamically update a horizontal position of the bar to indicate an order process rate for the at least one maturity bond in response to the at least one additional order.

12. The system of claim **11**, wherein a position of the bar corresponds to a value of processing of a corresponding order.

13. The system of claim **12**, wherein the height of the bar corresponds to a vertical height of the bar.

14. The system of claim **11**, wherein the graphical user interface further displays a name of an entity associated with the at least one order.

15. The system of claim **11**, wherein the graphical user interface further displays an order dollar value associated with the at least one order.

16. The system of claim **11**, wherein the graphical user interface is updated in real-time or near real-time.

17. The system of claim **11**, wherein the graphical user interface further displays a number of dollars that are available in a par amount for the at least one maturity bond or the at least one order.

18. The system of claim **11**, wherein the graphical user interface further displays at least one of a total monetary value corresponding the at least one order, a time remaining indicator, or a short fill percentage, mid fill percentage, or long fill percentage.

19. The system of claim **11**, wherein the graphical user interface further displays a manager associated with the at least one order.

20. The system of claim **11**, wherein the set of graphical indicators corresponding to the set of orders based on a time value corresponding to each order.

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